AMERICAN

Cinematographer

★ THE MOTION PICTURE CAMERA MAGAZINE ★

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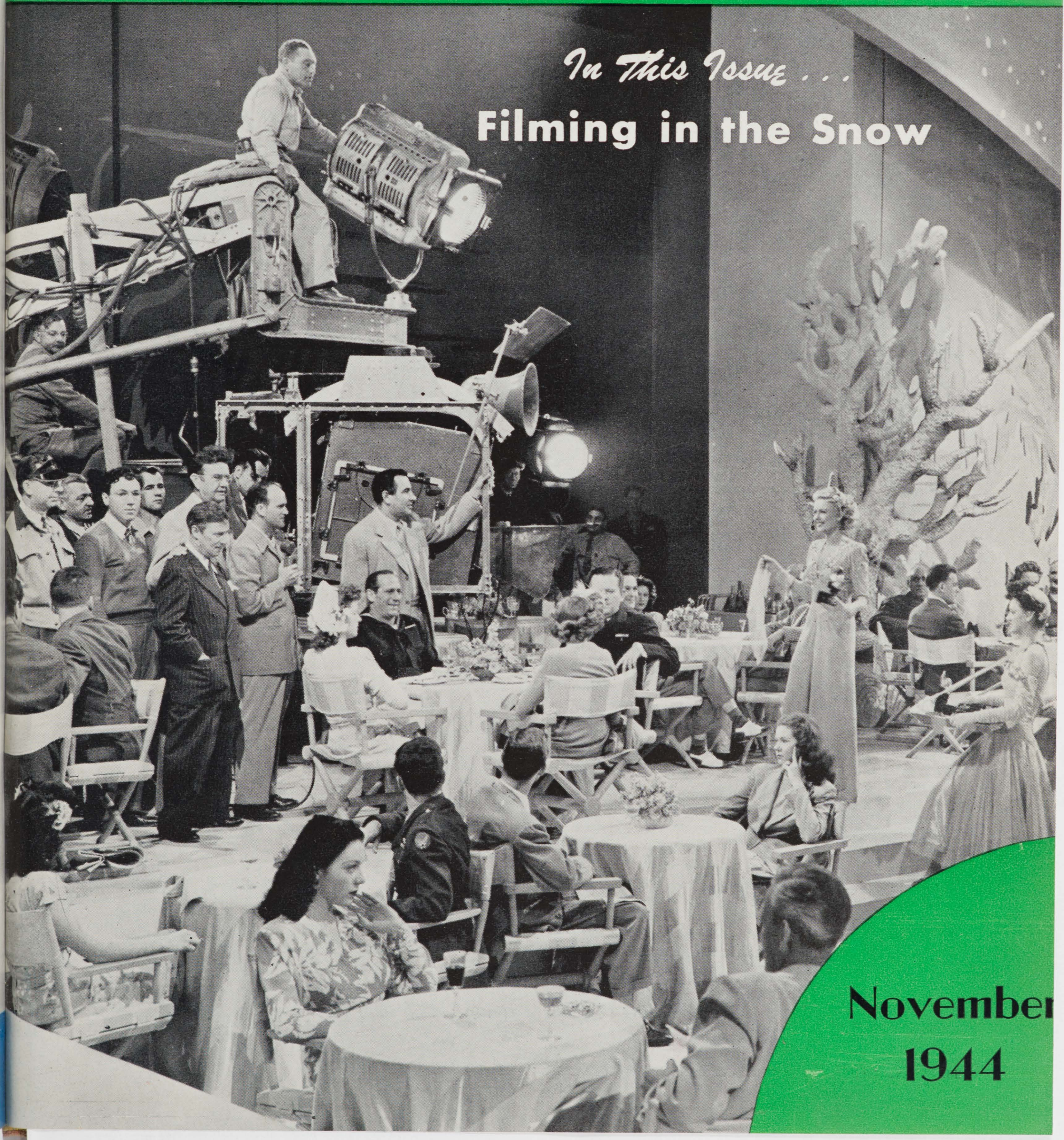

In This Issue . . .

Filming in the Snow

November
1944

(*No. 1 of a series on the manufacture of Du Pont Motion Picture Film.*)

. . . in the land of cotton

that's where the story of Du Pont Film begins

COTTON from the Southland is one of the basic raw materials from which Du Pont makes the crystal-clear base used for its motion picture film.

Through the magic of chemistry, cotton linters—the short fibres of cotton—are converted into esters of cellulose, a flaky snow-like material.

In huge stainless steel tanks these flakes are mixed with solvents under carefully controlled conditions to form a clear, viscous syrup known as "dope." From this syrup the base of Du Pont Motion Picture Film is produced.

In months to come we plan to tell you more about the interesting process that makes Du Pont film a superior product.

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ARMY E NAVY

Patterson Screen Division

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Film Products Division

Don Senick, Movietone News representative in the Pacific war theater newsreel pool, rests with his veteran Bell & Howell Eyemo beside a shot-up Jap Zero.

"Overboard twice but still going strong!"

"THE Eyemo Camera shown in Don Senick's hands in your August advertisement (*picture reprinted above*) has had a long and interesting history," writes Alfred D. Brick, Pacific Coast supervisor, Movietone News.

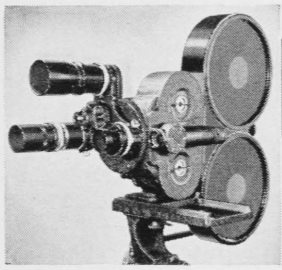
"With it I covered the Jap attack on Pearl Harbor, and I carried it for 22 months thereafter with the Fleet in the South Pacific. Senick has used it at Tarawa, in the second assault at Saipan, and now at Guam.

"It has been overboard twice, but is still going strong. The Company is justly proud of Senick's magnificent work."

⋆ ⋆ ⋆

It is typical of Eyemos to give service like that . . . to get fine pictures under the most difficult conditions . . . to keep on "going strong" despite unavoidable abuse. That's why most newsreel men use Eyemos.

Bell & Howell Company, Chicago; New York; Hollywood; Washington, D. C.; London. *Established 1907.*



Seven standard Eyemo models, plus a complete selection of correlated accessories, make Eyemo a *personal* camera, tailor-made to your own individual needs.

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Products combining the sciences of OPTIcs • electrONics • mechanICS

PRECISION-MADE BY

Opti-onics BELL & HOWELL

Bell & Howell

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7148 McCormick Road, Chicago 45
Please send information on Eyemo Cameras and accessories.

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AMERICAN CINEMATOGRAPHER

THE MOTION PICTURE CAMERA MAGAZINE

VOL. 25 NOVEMBER, 1944 NO. 11

CONTENTS

Aces of the Camera (Rolla Flora, A.S.C.)........*By* W. G. C. Bosco 367

The New Auricon Automatic-Parallax View-Range Camera Finder.. *By* W. G. C. Bosco 368

Reproduction of Color Sound Records..*By* R. Gorisch and P. Gorlich 370

High-Speed Cameras.......*By* E. D. Eyles, B.Sc., F. Inst., F.R.P.S. 372

Who Can Judge?................*By* Alvin Wyckoff, D.Sc., A.S.C. 374

Cihna Fights Wth Films, Too..................*By* Robert Joseph 376

Among the Movie Clubs.. 382

Filming in the Snow..............*By* Glenn R. Kershner, A.S.C. 384

THE FRONT COVER was made on the set of Paramount's Technicolor musical, "Bring On the Girls". Karl Struss, A.S.C., is the Director of Photography. This scene is a rehearsal, and Marjorie Reynolds is shown as she prepares to sing "How'd You Like to Take My Picture?" Sidney Lanfield is the director.

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66

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ADEL is pronounced the same the world over . . . ă-del′. Now famous for quality hydraulic, electric and mechanical armament and aircraft equipment, the name ADEL will be known after Victory for many other things . . . a new viewer for slide film, a new still color camera now being used in service and civilian hospitals, plus other photographic and cinematographic equipment. Back of ADEL's expanded production facilities is engineering skill which created the working mechanisms of a majority of studio cameras, experience which will bring new and better products for you in the future.

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After Victory . . . the ADEL-AGE

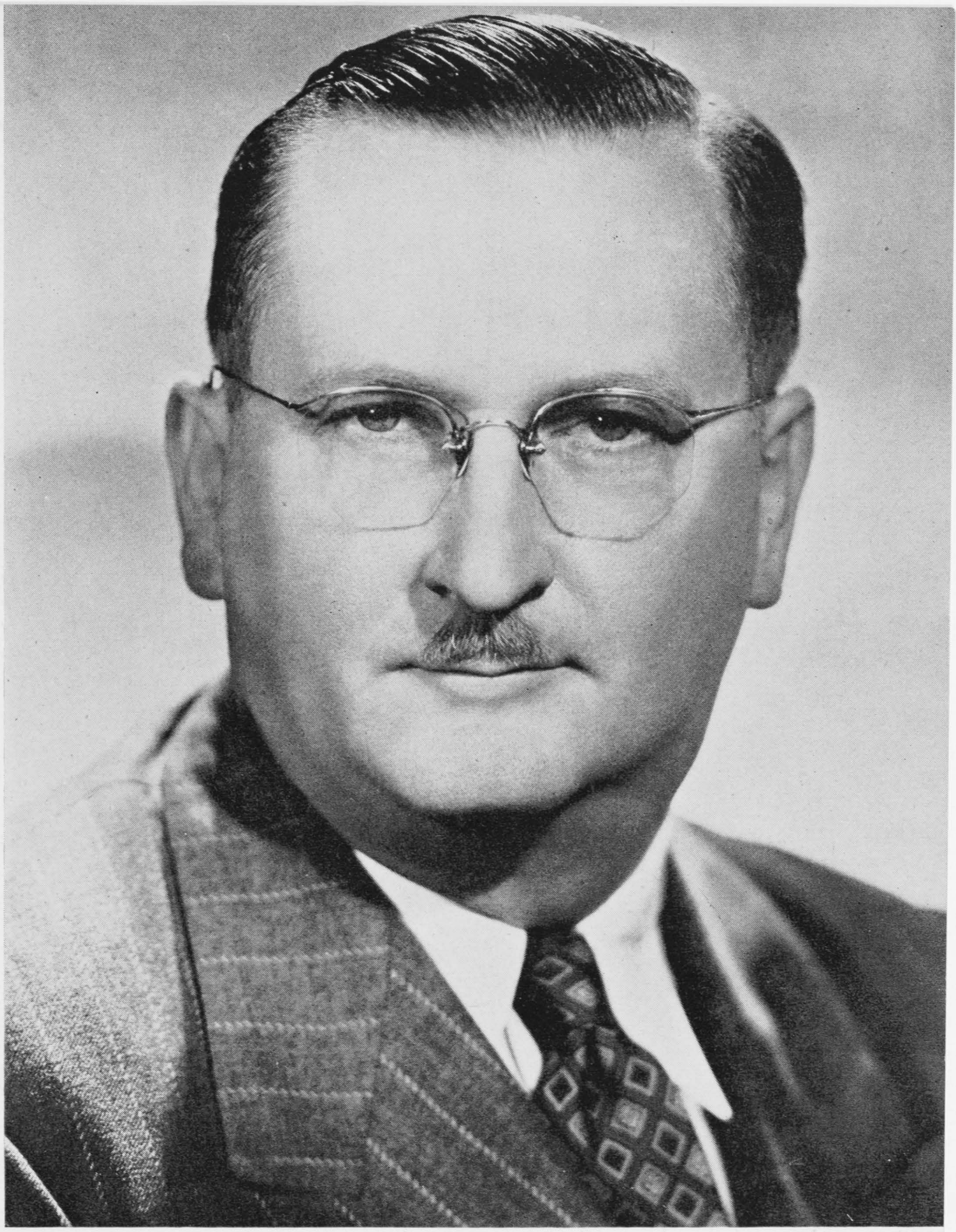
CHARMING is this photograph of Peggy O'Neill, film starlet, who has just completed a role in "It's A Pleasure" for International Pictures. Photo by Maurine.

ACES of the CAMERA

ROLLA FLORA, A.S.C.

By

W. G. C. BOSCO



THE contemporary motion picture owes much to the legitimate stage and has borrowed freely from other expressive art forms, but in the realm of special and optical effects it has originated at the same time both an art and a science peculiarly its own. This fascinating and mysterious ability of the motion picture to make things seem to be what they are not, to accomplish the impossible, and to seemingly make real the absurd and fantastic has, it can be admitted without lessening the credit due elsewhere, been largely instrumental in giving the cinematographic medium that unique quality of omnipresence which makes all things possible on the screen and won for the medium such a tremendous audience all over the world.

The amazing, though not always obvious, effects achieved in today's motion pictures are possible because of the tireless experimentation and research done by a small group of men who, adding genius and vision to experience, have been pushing back the frontiers of knowledge for the industry. These men, unheralded and unsung for the most part, have made tremendous contributions through the years to the improvement of the end product.

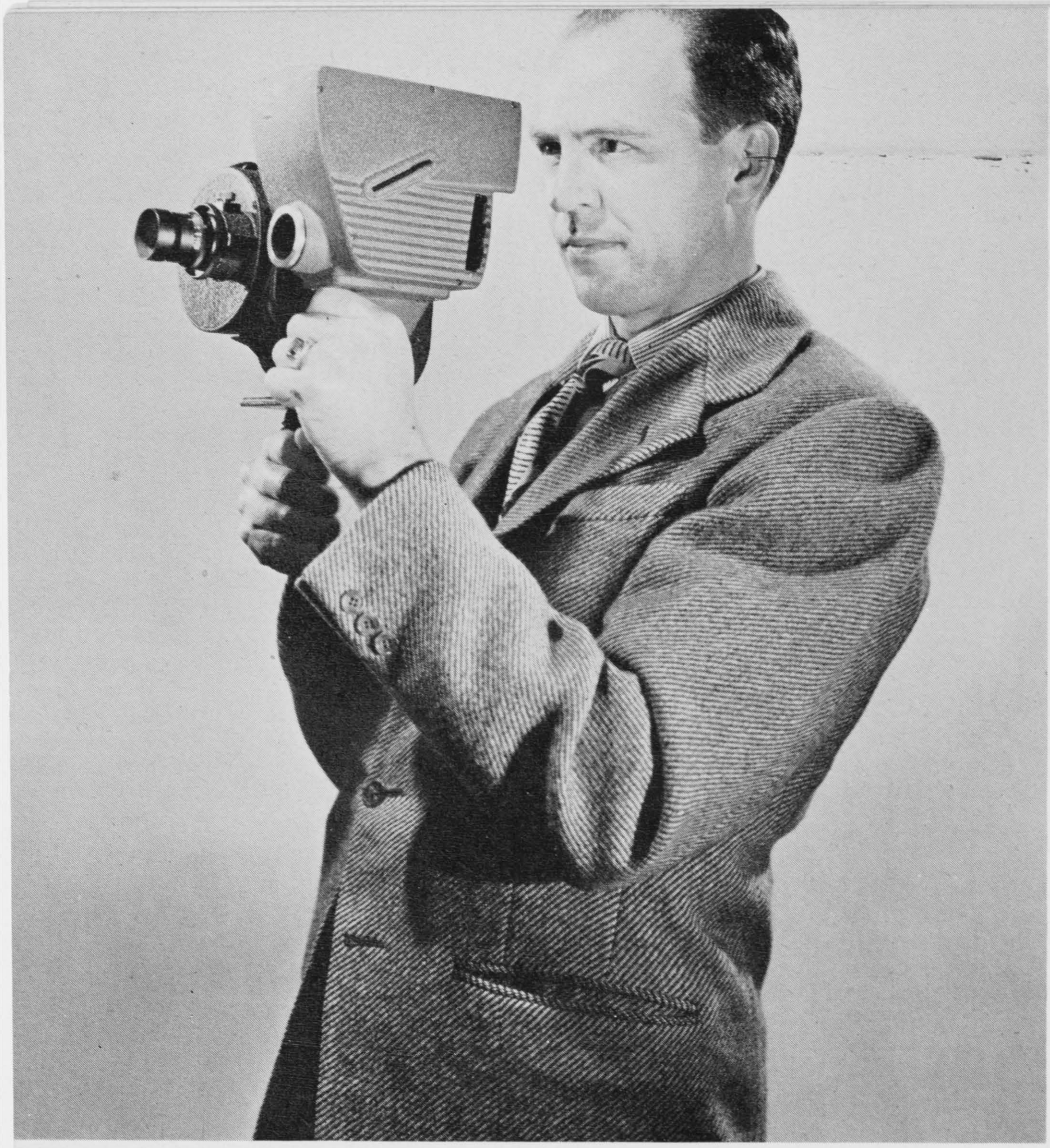
Prominent among this group of the technical elite is Rolla Flora, A.S.C. 20th Century Fox, who just signed him to another long term contract, gives him a title to provoke envy in an Oriental potentate: "Director of Montages and Optical Effects." But even a tag like that fails to convey the magnitude or the scope of Rolla's influence on the motion pictures carrying the Fox label. Those who can remember the eye-straining properties of the early pictures and the shortcomings of the first effect shots can appreciate part of the contribution he has made to the industry by his efforts and constant experimentation over the last twenty years to improve the quality of dupe negatives. And the Zoom lens, which opened up new opportunities for effect shots by making dolly shots possible when the use of a dolly was impossible, was another contribution developed by him eighteen years ago when he was under contract to Paramount. Its use permitted movie-goers the vicarious thrills of hurtling to the sidewalk from the top of a skyscraper, or to share the pilot's experience in a diving plane.

Rolla Flora started his photographic career in a drug store in the little town of The Dalles, Oregon, where he attended to the developing and printing for local Brownie snappers. By keeping his mind on the interesting possibilities latent in the science of photography at that time, and ignoring the subject matter imprinted on the negatives, because with monotonous regularity it showed some wag being devilishly funny in a woman's hat, he became possessed by a passion for photography. He came to Hollywood, and got his start in the picture business as an assistant in the Famous Players-Lasky lab in 1921.

Studious and conscientous, he was afraid that his brief formal education would be a handicap to the realization of his ambitions; so he haunted the universities and made arrangements to be tutored in physics, and subjects allied to the photographic arts and sciences, by undergraudates majoring in those subjects.

The first rungs of the ladder were climbed slowly and laboriously. From lab assistant he was promoted to still photographer, then to assistant cameraman, and then into the loading room. And in every spare moment he was experimenting or working on a new invention. His inventiveness and industrious determination brought encouragement from Roy Pomeroy, who, in 1923, gave him the chance he had been hoping for—trick photography.

(Continued on Page 389)



Left, Under combat conditions with camera held as shown, the cameraman has unobstructed vision above and to right and left of finder. He can see large upright finder image with both eyes, at any convenient viewing distance.

The New Auricon Automatic-Parallax View-Range Camera Finder

By W. G. C. BOSCO

BORROWING a page from the design of automatic aerial machine-gun sights, the new Auricon Automatic-Parallax View-Range Finder furnishes the cameraman, while he is shooting the picture, with an exact image of that picture as it will later appear on the screen.

Designed and manufactured for the Army by the E. M. Berndt Corp. of Hollywood, this new finder will soon be available for all cameramen doing work allied to the War effort. It answers a need long felt by cameramen engaged in all kinds of work and using all types of equipment because it will no longer be necessary to "hope for the best" after that first inadequate peep through the lens, or to try to follow action through a finder that is known to be "just a bit off."

Incorporating the latest developments in the science of optics, this first really modern finder is completely accurate and operates with the utmost simplicity. It provides an erect, needle-sharp image framed on ground glass, right side up, and correct right to left, located at the front of a deep shadow box for maximum contrast and visibility. The finder image is so clear that a newspaper headline can be read with the finder at a distance of fifteen feet, or an airplane can be accurately located while just a speck in the sky. There is no dilution of the image as seen in the finder, and no "ghosts" or reflection in the image. Nor does the cameraman see his own reflection in the glass when working in bright sunlight. It combines automatic parallax compensation with a View-Range Finder which enables the operator to measure the distance from camera to subject in the finder and set his camera-lens accordingly.

When shooting a scene, the cameraman can hold the finder directly against his forehead, in which case the finder sunshade is cushioned with sponge rubber pads. He will then be viewing the image at an optical distance of 10 inches (the finder itself measures only 6 inches long). On the other hand, he can, if he so desires, move back and look at the image at any convenient distance without regard to an exact eye position. The framing of the image in the finder does not depend on the viewing position of the eye, as in the case of "peep-hole" finders, and both eyes are used to look at the finder image at all viewing positions.

Under combat or field conditions, using the Auricon Finder does not blind the cameraman to what is happening around him, as is the case with "peep-hole" finders. He can operate the camera and finder about a foot in front of him and thus see above the camera and to right and left, with both eyes open.

The difference in viewpoint (or displacement) between camera and finder lenses, commonly called parallax, is automatically compensated for so that whatever is sharply focused in the finder is also corrected for parallax in the finder frame. The parallax adjustment is done optically inside the finder allowing the external finder casing to be solidly attached to the camera body. This provides a rugged and dependable arrangement and the lineup between camera and finder cannot be thrown out of critical adjustment by accidental blows or shocks to the finder casing or camera.

The automatic-parallax adjustment is controlled by a cam-plate located inside the finder casing. This cam-plate determines the displacement distance between camera lens and finder lens, for which the finder automatically compensates.

In the case of the Eyemo 35 mm camera, the displacement distance is 2.750 inches. If, for instance, this finder were later to be installed on a different camera having a displacement distance of, say 4 inches, the cam-plate can easily be exchanged, with the use of a screwdriver alone, for one intended for a 4-inch displacement distance. Thus parallax recalibration of the finder is avoided, for the footage-scale which controls the focusing range-finder and the auto-parallax is untouched.

The auto-parallax adjustment on the Auricon Finder has been mechanically worked out to five decimal places and is more reliable than former methods of cut-and-try parallax calibration accurate at only a few points.

While the finder is shown adapted to a 35 mm Eyemo Camera, it can also be used with 16 mm cameras such as the Filmo, Victor, Bolex, etc. For the Kodak Cine-Special, a finder mounting has been designed which enables magazines to be changed without disturbing the finder.

The finder can be finished to cover 35 mm sound or silent camera or projector apertures, or 16 mm apertures, either camera or projector. Except for special applications, a finder covering the sound-projector aperture would be used.

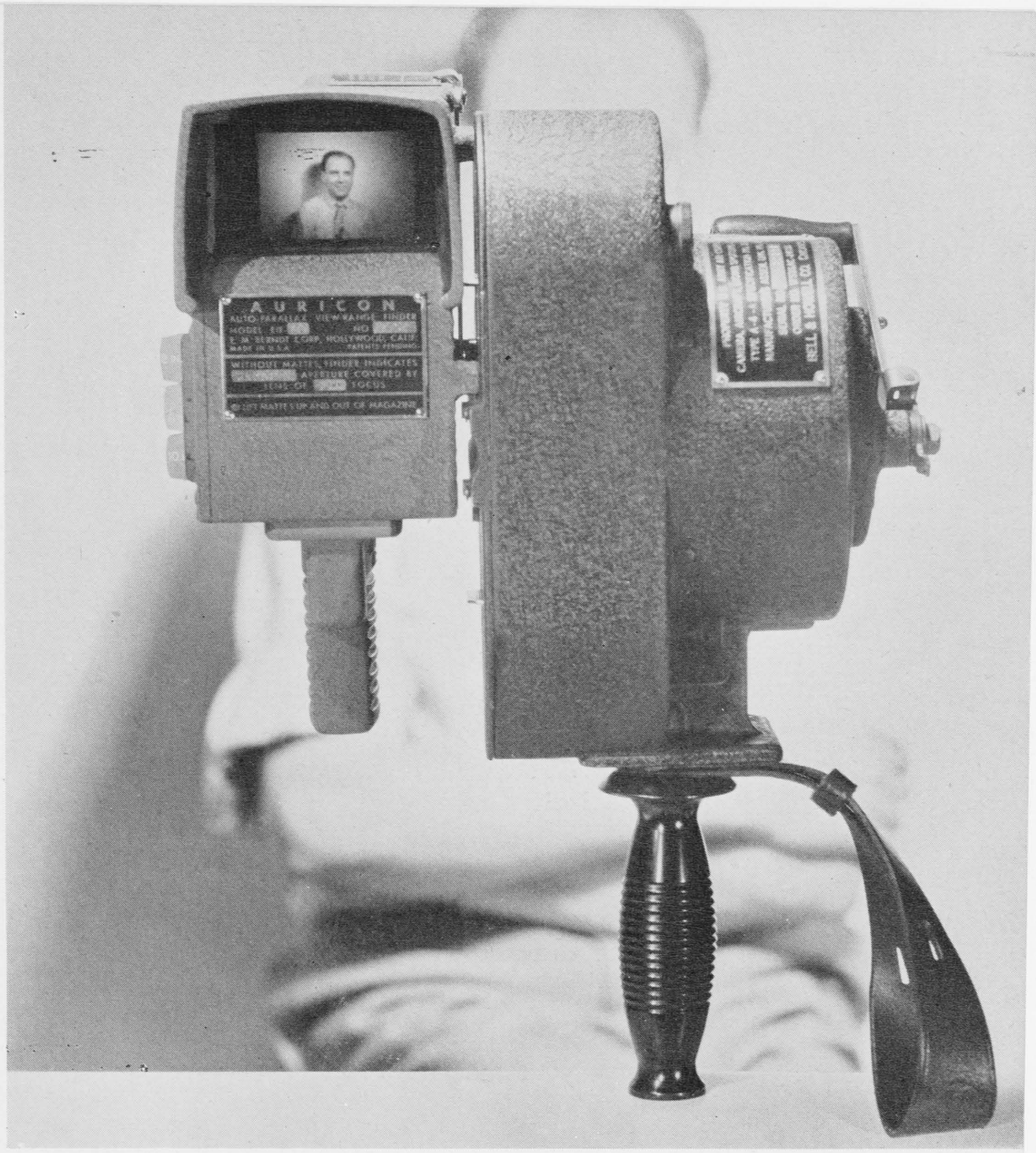
For cameras using 35 mm film, the finder covers lens fields from a 35 mm wide angle (which is the full frame shown in the finder), 40 mm, 2-inch, etc., up to the 6- and 10-inch telephoto lenses, by means of inserted mattes.

When the finder is used with a 16 mm camera it will cover lens-fields ranging from the 17.5 mm wide-angle lens up to the 6-inch telephoto lens.

A magazine to carry up to 9 mattes is located in the back of the finder. A special device retains the mattes in the magazine chamber, yet an easy pull up-and-out releases the matte to be used. Another device incorporated in the matte slide at the ground-glass viewing screen, makes it impossible to insert mattes upside-down. This prevents errors when using mattes which have been individually cut to match telephoto lenses which may not center exactly on the camera frame.

A special master matte is available for test purposes in lining up perspective scenes or for fast camera operation where there is no time to change mattes. This master matte is of colorless, transparent Lucite and carries reticles showing the apertures covered (in the case of the Eyemo 35 mm camera) by 40 mm, 2-, 4-, 6- and 10-inch lenses, or other combinations if desired. With this master matte the correct lens to use for an individual scene is quickly apparent after which the master matte can be replaced with one covering only the single lens-field desired.

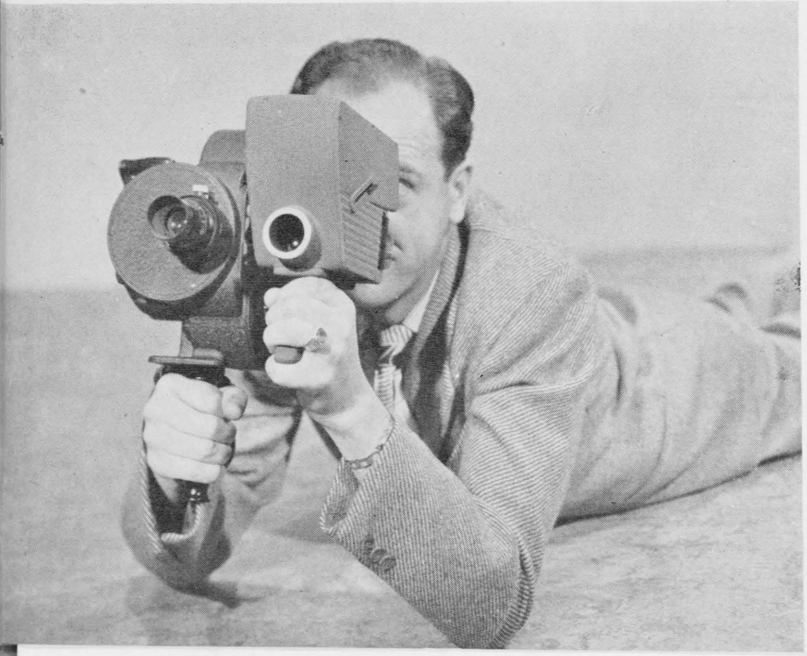
This new Auricon Finder is as unique in its field as the photo-electric cell exposure meter was in its field, when first introduced. For the first time a camera finder is available which is designed and built as a precision instrument. It should be a definite contribution for better pictures on the motion picture screen, and towards elimination of trouble and inaccuracy arising from the inadequate "peep-hole" finders available until now.

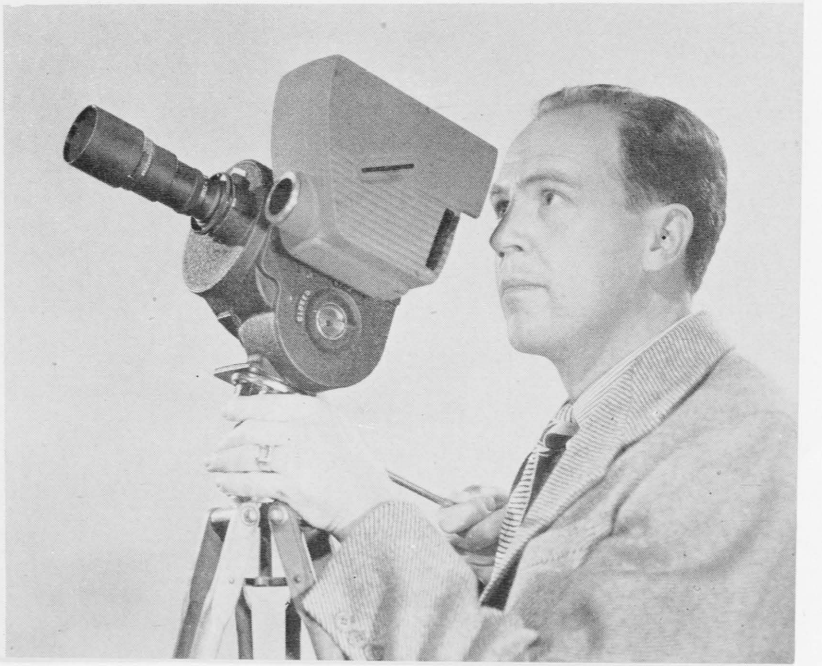

AURICON
AUTO-PARALLAX VIEW-RANGE FINDER
E. M. BERNDT CORP. HOLLYWOOD, CALIF.
MADE IN U.S.A.
PATENTS PENDING
WITHOUT MATTES, FINDER INDICATES
APERTURE COVERED BY
LENS OF
FOCUS
LIFT MATTES UP AND OUT OF MAGAZINE

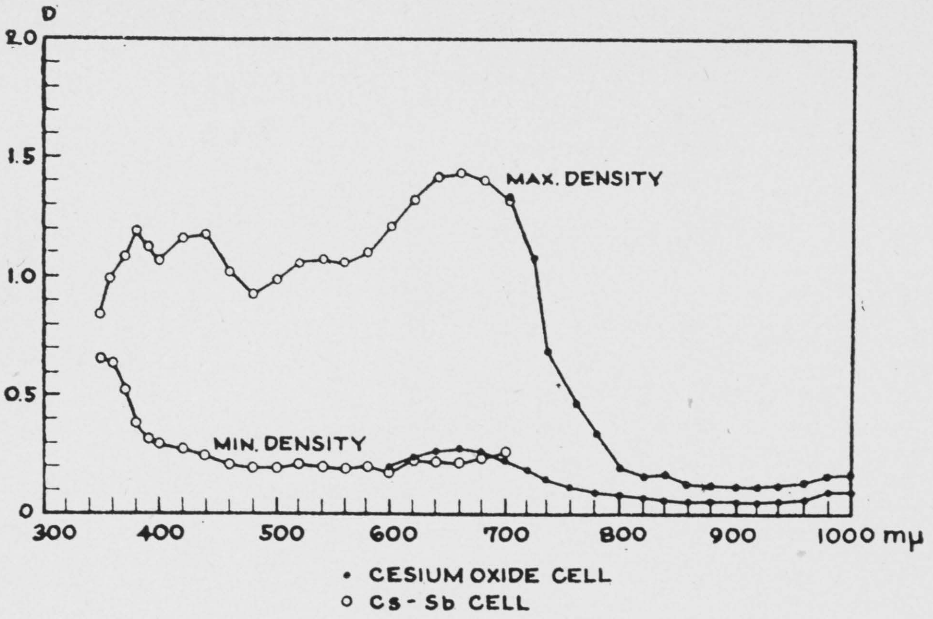
Above, Unretouched photograph looking through the new Auricon Finder, showing large needle-sharp image, upright and correct right to left. Focusing this image in the finder automatically corrects parallax and also indicates distance from camera to subject being photographed.

Bottom left, without tripod, "pistol-grips" on finder and camera provide means for shooting steady pictures in any position.

Bottom right, with pistol grips detached from finder and camera, equipment is used in the conventional manner with tripod.







Left, Fig. 1. Density of Agfacolor sound track as a function of wave length.

Reproduction of Color Sound Records

By R. GORISCH and P. GORLICH

THE question of a sound record on color film seemed to have arrived at a final solution, because only a few of the proposed color film processes satisfied the constantly increasing requirements, and therefore the possibilities for sound recording became less numerous. Silver sound tracks were recommended for the more successful color film processes, as for example, in the case of Agfacolor film, where by means of a special protecting method, a black-and-white instead of a colored track was obtained, or in the Technicolor process, where black-and-white stock already containing the sound record served as a base on which color transfers were made. However, this technical development was interrupted when, for reasons of simplicity and perhaps of cost, it was tried in the Agfacolor process to produce a colored sound track exactly in the same manner as the picture. The following discussions deal with the phenomena occurring in the reproduction of such colored sound tracks. In conclusion and for the evalution of the results new types of photoelectric cells will also be discussed.

Even the first educational and advertising films prepared by the Agfacolor process showed that the correct reproduction of sound offered greater difficulties with a colored track than in the case of black-and-white. This phenomenon was not particularly studied at that time because the color process was only in the experimental stage. However, since regular features are now produced by this process, it seems worth while to study the problem more closely. Even when the first experiments were made, it was found that the volume control of the reproducer had to be adjusted to a higher setting if a colored track was played, and that the noise level of such a track was much increased. High in the case of fresh prints, it rapidly became unbearable as the film wore out.

For a study of the question of whether these two phenomena are connected, and what is their cause, we have made some experiments which will now be reported. First, however, we shall briefly mention previous publications on the question of the reproduction of colored sound tracks.

The question of colored sound tracks has been discussed for a long time in connection with earlier two-color films. These films used positive stock coated on both sides with emulsion layers that were toned in complementary colors, and the question arose on which side the sound track should be printed. Otis[1] found that this question cannot be answered in a general way, but that it was important to know the spectral sensitivity of the photoelectric cell used for reproduction. He found, for example, that, if the sound track of the multicolor film is in the blue layer, the film is much better reproduced with a red-sensitive caesium cell than with a blue-sensitive potassium cell. The reason for this is that the light modulation of the blue-toned sound track runs between blue and white, and that blue light does not appear appreciably darker to a blue-sensitive cell than white light. To a red-sensitive cell, however, the blue parts of the track appear almost opaque.

Because of these considerations, it was proposed[2] that each of the several colored layers could contain a different sound record, perhaps in different languages or covering different frequency ranges, etc., and anyone could be selected for reproduction by changing the photoelectric cell, or by using colored filters in connection with a cell sensitive to all colors. As interesting as this proposition was, it failed because the absorption regions of the available dyes overlapped. Later it was tried to place identical tracks in all layers and thus eliminate the defects characteristic of a single-layer sound track.[3] This consideration led to the suggestion of the black-and-white silver sound track, as described in the beginning.

The fact that a color-developed sound track cannot be avoided in certain processes suggested investigations of the expected noise level,[4] and also of the sound volume and distortion.[5] The results of these investigations do not show that these simplified colored sound tracks are necessarily unsatisfactory.

The chemical structure of the sound track is immaterial, and the results are mainly determined by its absorption characteristics in the spectral regions in which the reproducer photoelectric cell is sensitive. The investigation of the question, why the sound volume is low and the noise level high, must start at this place. Fig. 1 shows spectro-photometric curves of Agfacolor sound track made at areas of maximum and minimum densities.

The abscissa (Fig. 1-translator) shows the wave length of the light and the ordinate the corresponding density. The measurement was carried out in two steps, first for the visible light and the long-wave ultraviolet, and then for the infra-red and the connecting red part of the spectrum.

In order to show more clearly the phenomena in sound reproduction, Fig. 2 shows the same measurements converted from density to transmission. The distance between the two curves at any wave length represents the greatest possible sound modulation at that wave length for this type of track. Therefore, the region between the two curves is crosshatched in Fig. 2. If we start from the premise that the spectral sensitivity of the photoelectric cell must be adapted to the region of greatest modulation, we should use for this film a photoelectric cell which has a sensitivity only in the

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Note: The article above was reprinted from Kinotechnik. The translation was by Werner Eichler, Research Laboratories, Eastman Kodak Company, Rochester, N. Y., and is printed here through the courtesy of the S.M.P.E. Journal

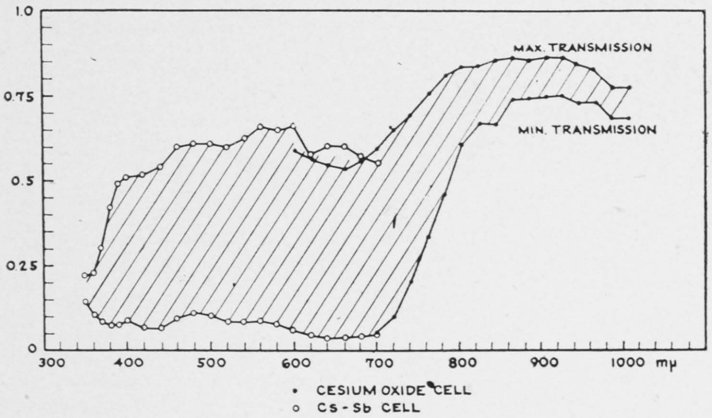


FIG. 2. Transmission of Agfacolor sound track and fog as a function of wave length.

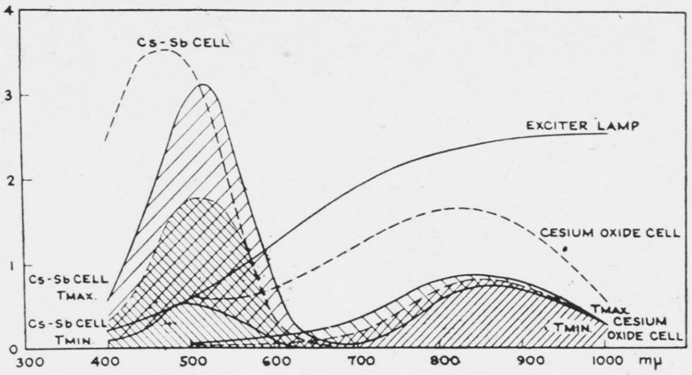


FIG. 3. Relationship between photocell current and wave length for Agfacolor sound track and 2 photocells of a different type. The spectral sensitivity curves of the 2 photocells as reduced to equal energy input and the spectral characteristic of the exciter lamp are also shown.

visible region, especially at about 650 mμ. However, this is not the case in modern photoelectric cells. Their sensitivity lies in the infra-red, therefore, in a region in which the maximum density of the sound record is low, their transmission, therefore, is very great. In addition, the sound lamp radiates more strongly in the infra-red than in the visible spectrum. If we multiply for each wave length the three factors influencing the magnitude at the photoelectric current, that is, film transmission, sensitivity of the cell, and sound lamp radiation, as is done in Fig. 3, we obtain the spectral distribution of the product for these as shown by the curves of Fig. 3 represented by the designation caesium oxide cell. The two cases of maximum and minimum density are shown. The area lying between such a curve and the absicissa corresponds to the total current flowing through the photoelectric cell. The area between the average of the two curves and the abscissa represents, therefore, the average photocell current, the area between the two curves the photocell modulation. For the caesium oxide cell we cannot expect good results on account of the poor relation between the two areas.

If we substitute for the infra-red-sensitive photoelectric cell, a cell which has its sensitivity maximum in the region of the blue light (Cs, Sb cell), entirely different curves are obtained. These curves are also recorded in Fig. 3, and the sound lamp radiation is considered as before. It is seen that for these cells a much more favorable relation exists between the photocell rest current and the modulation alternating current.

In order to extend these results to the practice, a sound strip was photometered with the same cells. The following values were obtained:

	Caesium Oxide Cell Per Cent	Cs, Sb Cell Per Cent
Tmax.	88	60
Tmin.	70	7
ΔT	18	53
TR	79	33.5

These values clearly explain the low sound modulation with the use of the customary cells. Küster[5] compared in his work the color reversal film with a silver reversal film. He found a lower modulation for the color film which revealed scattered values even if photocells of one type were used so that, apparently, small differences in individual cells have a considerable effect. However, only caesium cells were studied.

On the question of background noise it has been found previously[4] that in the conversion of a silver image to a dye image a change of the background noise occurs. This may be calculated by determining the change in the transmission of the layer. However, this is merely noise from grain, or that part of the background noise which is based on the grain structure and which is heard only with entirely undamaged film. This is less important in practice because the so-called scratch noise, including all the noises due to dust particles, scratches, dirt spots, etc., is normally stronger and increases considerably after the film has been used for some time. This scratch noise is proportional to the average transmission of the sound track, because all dust particles and other irregularities cause a much greater light impulse, if the film is more transparent. The last line of the table shows that for normal photocells the average transmission TR of the color sound track is very high and, consequently, when this cell is used a very strong background noise must be expected, which is even increased as the reproducer gain is raised on account of the low modulation.

Therefore, the two phenomena of low sound modulation and high ground noise are connected with each other, and both have their cause in the improper adaptation of the photocell to the absorption of the dyes composing the sound record. It is clear that the use of other photocells will give much better results. The right column of the table contains the values for a blue-sensitive photocell. It is seen that the modulation is much greater than that of the caesium cell and that the average transmission is decreased. Practice has shown that color-developed sound records can be reproduced well with these cells.

These explanations show why the external photoelectric effect was chosen for sound reproduction from the group of photoelectric phenomena. In addition to the advantage of the great internal resistance of these cells[6] they have the further advantage neglected for many years, that the spectral sensitivity of the cell can be changed according to the purpose and depending on the choice of the cathode material or the cathode layer. The caesium oxide cell generally fulfilled the requirements of sensitivity and spectral distribution for the reproduction of silver sound tracks. We disregard here the frequent desire to shift the spectral distribution of these cells beyond 1200 mμ toward the infra-red in order to be able to use the red rays of the sound lamps better.

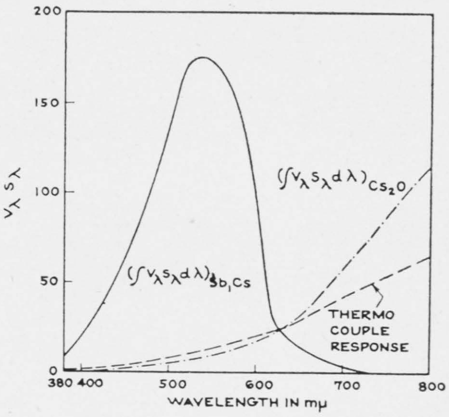
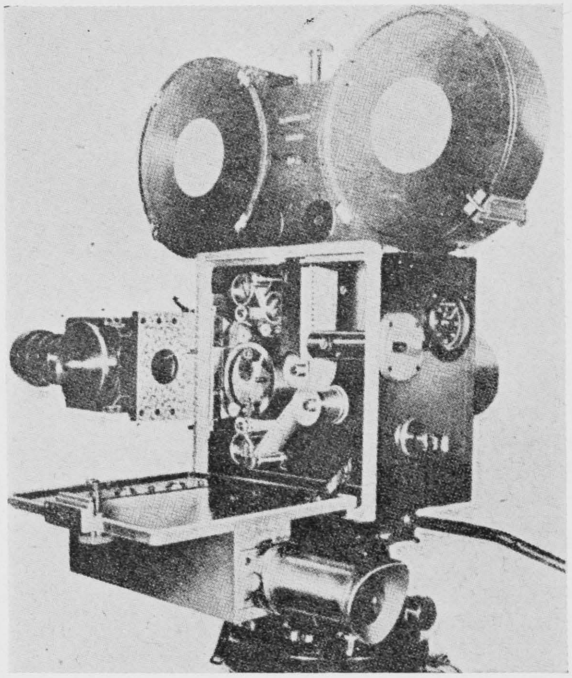


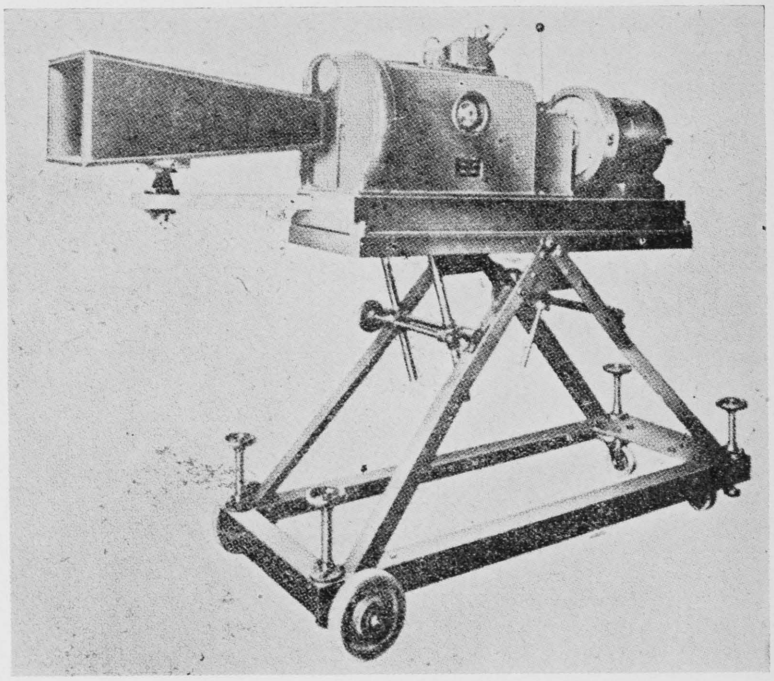
FIG. 4. Relative spectral response of caesium oxide and Cs-Sb photoelectric cells.

Research in the field of high-sensitive oxidized alkali cathodes, among which is the caesium oxide cathode, was promoted mostly by Asao, de Boer, Kluge, and Gorlich and, referred to the caesium oxide cathode, gave approximately the following picture[7]: The caesium oxide layer coated on a silver support contains caesium atoms. Adsorbed caesium atoms are on the surface and decrease the energy necessary to liberate electrons so that the degree of coverage plays an important part. The photoelectric sensitivity may be increased by additional introduction of foreign metal atoms.

The requirement of the photocell with respect to colored sound track, namely,

(Continued on Page 388)





Above left, Fig. 1. Vinten H.S. 300 High-Speed Camera.

Above right, Fig. 2. Vinten H.S. 3000 High-Speed Camera. 6

High-Speed Cameras

By E. D. EYLES, B. Sc., F. Inst. P., F. R. P. S.*

AMONG the limitations of the eye in observing the course of a scientific experiment is its inability to follow rapid movement. This limitation is most forcibly demonstrated by the conjuror who, by sleight of hand, can completely deceive the eyes of his audience. To illustrate this, here is a simple trick performed with the aid of a short length of rope. Grasping one end of the rope firmly in each hand and looping it in a prescribed fashion over the wrists, one may, by a rapid variation in the movement of the hands in throwing the rope from the wrists, either form, or fail to form, a knot in the rope at will. The variation in the movement of the hands is imperceptible to the eye solely because of the rapidity of that movement. *(The lecturer here demonstrated his point by performing the trick.)*

In order to obtain a solution to a problem of this sort, which has many counterparts in scientific work and mechanical engineering, it is necessary to adopt some means whereby the action can be slowed down to give the eye effectively more time to appreciate its detail. The only method available in solving such problems is to take a whole series of photographs at short intervals throughout the action. If these are taken on conventional motion picture film, the action can then be synthesized, at a rate slow enough for the eye to follow its subtleties, by projecting the film at a fraction of the taking speed. This effectively magnifies the duration of the action.

The normal projection frequency for films without a sound track is sixteen pictures per second. At frequencies below this, at the level of screen illumination required for satisfactory viewing, flicker becomes objectionable. A film will now be projected of the trick which has just been performed and careful attention to the movement of the conjuror's right hand will reveal the difference in the action which determines the formation of the knot. Slowing the action down sixteen times, as indicated in the sub-title of the film, requires that the pictures be taken at a frequency of about 250 per second, while prolonging the action to sixty-five times its actual duration requires a taking frequency of about 1,000 pictures per second. At this taking frequency of 1,000 pictures per second, the wrist movement, the duration of which is of the order of 1/5 second in actual practice, can be prolonged to some 10 to 12 seconds on the screen. It will be appreciated that finer detail in the movement can be revealed by examination of individual pictures, from which measurements of the mechanical displacements can be made if necessary. Further, if at the time that the pictures are taken a time scale is photographed alongside them on the film, it is possible to make a complete analysis of the motions involved with respect to time.

Intermittent Film Movement

Having outlined the problem and indicated the method by which it can be solved, it remains to consider cameras designed to obtain the desired photographs. It is proposed to consider only cameras which are available commercially and which can be used in conjunction with standard 35mm or substandard 16mm or 8mm motion picture film upon which are recorded pictures in the conventional manner suitable for projection on normal motion picture projectors. The wider aspects of the problem and more specialized types of apparatus have been dealt with very thoroughly throughout the scientific literature, a bibliography of which has been given by the author elsewhere.[1]

Some ordinary kinematograph cameras will take pictures at frequencies up to 128 per second. The films so obtained and projected at 24 pictures per second produce the well-known "slow-motion" studies of the action of racehorses and athletes with which everyone who visits the kinema is familiar. The "time magnification factor" effected under these conditions is only 5, but is sufficient to reduce the speed of the action so that the eye can follow it. The film transport in such cameras is intermittent, that is, the film remains stationary in the gate while the shutter is open and the picture is being taken. When the shutter is closed, the film is moved forward rapidly by a claw mechanism, bringing the next section into position in the gate. It is possible to run cameras of this type at frequencies up to about 300 pictures per second, a performance which is a tribute both to the accuracy of the workmanship of the camera engineer and the film manufacturer who perforates the film.

One camera of this type is the Vinten H.S.300 which is shown in the photograph, Fig. 1. The motor runs from a low voltage battery supply, and the pilot pins and other reciprocating parts have been specially designed to stand the

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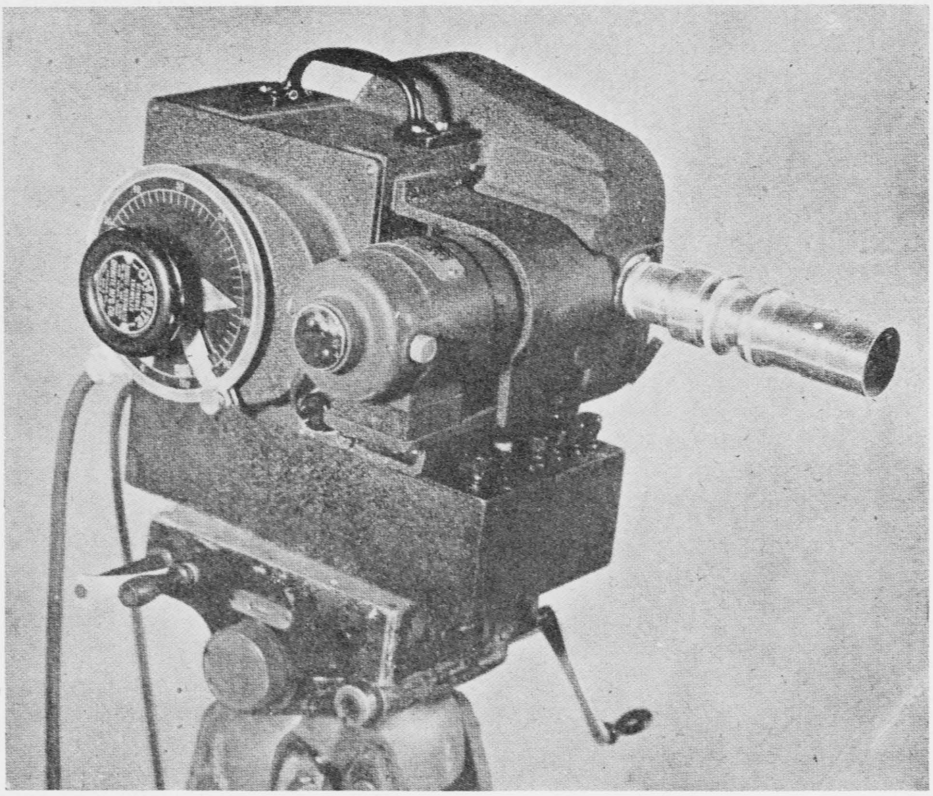
* An address delivered before the British Kinematograph Society on February 9th, 1944.



Right, Fig. 3. Eastman Kodak High-Speed Camera, Type III.

strain imposed upon them in starting and stopping 300 times every second. A time record can be photographed alongside the pictures by means of the light from a small spark controlled by a tuning fork.

Continuous Film Movement

At taking frequencies above 300 per second, it becomes necessary to move the film continuously through the gate. To preserve the definition in the picture while the shutter is open, two methods have been used. In the first of these, optical compensation is provided for the movement of the film, while in the second the exposure time is so reduced that the movement of the film in that time is negligible and consequently good definition is maintained. This is arranged by the use of a flashing light source to illuminate the subject, the duration of the flashes being controlled electrically and their frequency determined by mechanical synchronization from the film driving shaft in the camera.

Optical Compensation

Probably the first high speed camera in which optical compensation for film movement was used was that designed by C. Francis Jenkins and first described about 1923.[2, 3] This camera incorporated a series of forty-eight matched lenses spaced round the periphery of a circular disc which was rotated in front of the film and synchronized, through gears, with the film movement. In this way the image on the film is moved at the same rate, and substantially in the same direction, as the film while the exposure is being made.

Complete compensation cannot be obtained unless two such lens rings revolving in opposite directions are used, because the lenses move on an arc while the film moves in a straight line. However, over the relatively small movements involved, compensation is sufficiently satisfactory and good definition is preserved. The aperture of the lenses was f/3.5, and the camera, which used 35 mm. film, was a very heavy machine requiring a four horse-power motor to drive it fast enough to obtain a picture frequency of 2,000 per second.

However, some excellent pictures were taken with this instrument, the modern counterpart of which is the Vinten H.S. 3,000 high speed camera first described in 1939[4] and shown in Fig. 2. A number of these cameras, which are built on rugged wheeled stands, are giving valuable service in armaments research work in this country at the present time.

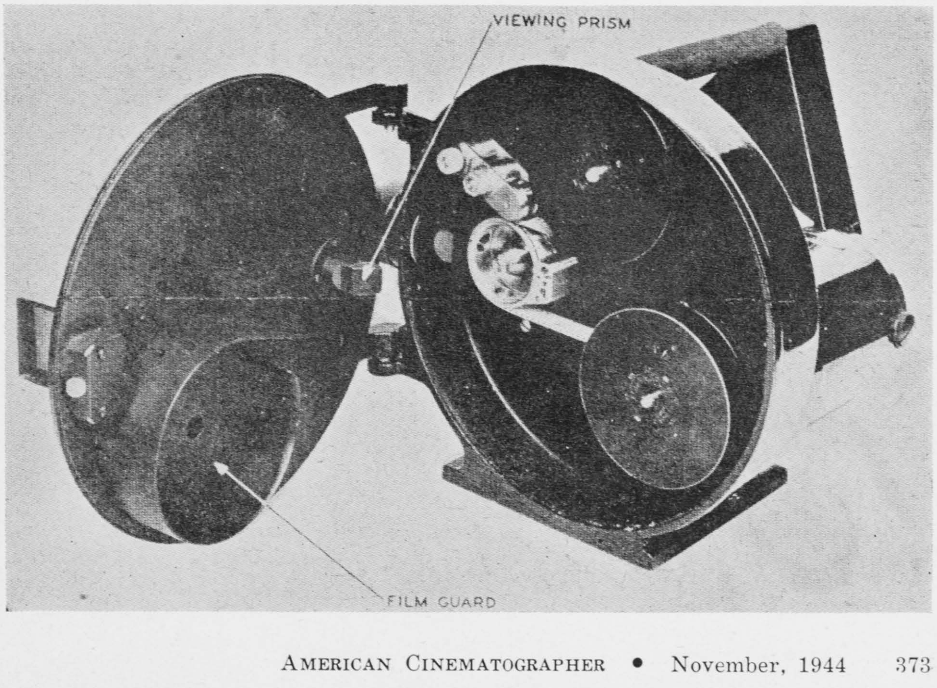
Another type of optical compensator is that first described by Tuttle[5] in 1933 and used in one form in the Eastman Kodak range of high speed cameras and in this and other forms in the Bell Telephone Laboratories high speed cameras, the most modern member of which is the "Fastax."

Eastman Kodak High-Speed Cameras

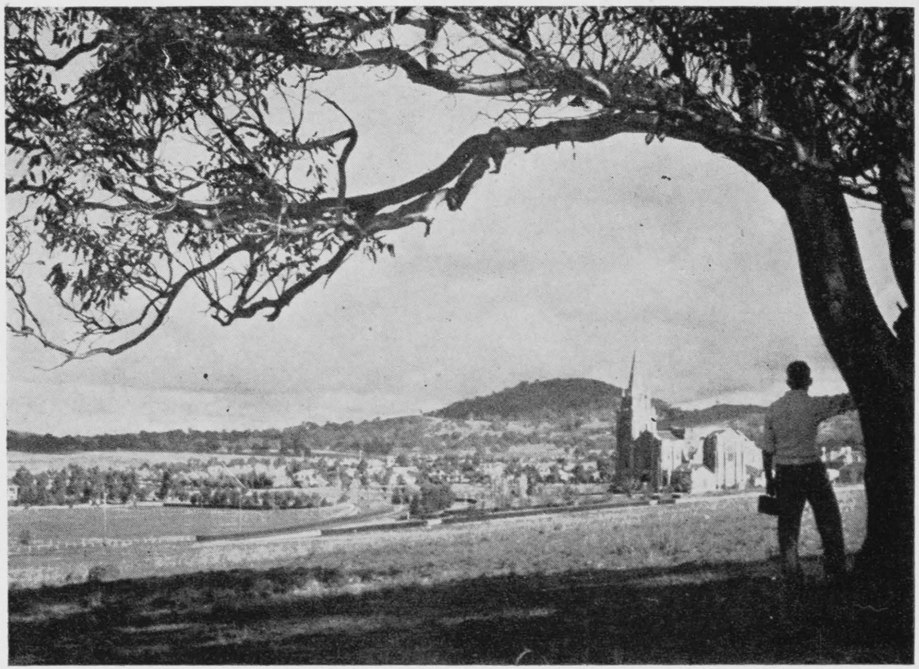
In the Eastman Kodak high speed camera, which is built to use 16mm. film, the compensator takes the form of a rectangular glass prism housed in a barrel type shutter. This is rotated between the camera lens and the film, its optical thickness and rate of rotation being so arranged that no relative motion of image and film occurs while the shutter is open. Compensation is again not perfect, some slight distortion occurring at top and bottom of the picture, but the definition compares very well with that given by the best 16mm. cameras of conventional type running at normal speeds.

A photograph of the latest model of the Eastman Kodak High Speed camera, the Type III, is shown in Fig. 3. The camera is very small and portable, weighing only 55 pounds. It is driven by a 32 volt series-wound motor to which 115 volts is applied through a series resistance. This resistance is reduced automatically through a clutch driven from the motor until the speed of the camera reaches the desired value, which can be preset by a stop on the resistance control to leave a given amount of resistance in circuit with the motor. This system en-

(Continued on Page 380)



Right, Fig. 4. "Fastax" High-Speed Camera.



Who Can Judge?

By ALVIN WYCKOFF, D. Sc., A. S. C.

DO you get discouraged easily? Does some friend, or shall we say, acquaintance, spoil the fun you've had taking pictures after your own fancy? If the answer is "yes," then buck-up; take courage.

Let's try and analyze the reason for this emotion of displeasure. Let's break it up; stop the cause that stirs up your sensitiveness until it smarts with real pain every time some rude individual criticises the result of your photographic effort; picks your subject all apart to prove to you that it doesn't conform to the rules of artistic arrangement by laying out geometric angles across the skyline, the foreground and the margins until there isn't enough of the print left to look at.

There are certain definite rules that govern the basic arrangement of what is termed by artists, "Art," just as there are rules for the working out of mathematical problems, yet there are many brilliant minds that know as little about mathematical rules as there are those who are unacquainted with the priciples governing artistic perfection. But they succeed in getting the right answers to their problems regardless of the set, scientific rules. They get the same correct answers as the well trained and studied mind, and sometimes, quicker.

The same is true in the realm of "Art." There are those individuals who have never studied any of the rules pertaining to the basic arrangement of artistic lines and curves, but they can "out-art" a few of the artists who have devoted many hours of laborious study in their devotion to master the precise and correct arrangement of all the art curves and angles.

After all, what is it that makes a picture appear pleasing or displeasing? Isn't it the concept one forms in his own mind regarding it? We don't all like the same pictures any more than we like the same automobiles.

He who plays with photography as a hobby does so because he enjoys it as a form of pleasure; a distraction from the things of life that are irksome, and the pictures he takes are definite objects. If he carries his photographic steps through to a finished print he has a hobby that is as engrossing as any form of artistic endeavor could be, and for real instructive pleasure the photo-enthusiasts SHOULD follow every exposure of button pressing through its developing and printing stages.

Every time he aims his camera at an objective and "presses the button" he does so with a definite reason in mind; a picture he wants to make as a record to refer to again and again or perhaps a picture of something he wants to send away to some friend that will illustrate his descriptive words.

Why do so many of us "snap" pictures of animals? Maybe the animals are out back of the barn midst surroundings that would make the ego-artist-critic choke with spasms of self-righteous indignation. But the picture is something YOU wanted, and to YOU it has merit; it is even artistic for what it is.

We may take a picture of a crowd going into a baseball game. Why? Because we are impressed by something about the crowd that is unusual; it's a different kind of a crowd. Someone we know in that crowd is sweating, cussing, and being pushed around. It's a picture that would be worth having. Something to show later on to the cussing man. To YOU it's a good picture because it tells something. It has a story attached to it, not of artistry; you didn't go in for art, but to YOU it's a wow and it CAN be interesting to others.

What about pictures of the girl friend? Maybe she's out in the garden trying to work out the weeds with a hoe, or down at the beach, or speeding down a roller coaster with her hair streaming out behind her and all fluffed up, hair pins all gone, her mouth wide open, her skirts blown up around her middle? Is it a good picture? Sure, it is to YOU. Maybe the girl friend would tell you it's "awful" and want it destroyed, but it brings back an active memory and tells a story all over again.

A picture should be something of human interest, not of artistry for art's sake. The very fact that a picture has story-interest proves it has merit and quality.

Pictures don't have to be artistic to be good. Pictures of human interest, pictures that will tell a story, news-pictures, are always interesting and compelling not only to the one who takes them but to many others.

Pictures of interesting story-telling can not always be of the artistic composition demanded by the ego-critic who "thinks he knows art." But on the other hand, if you go out to capture landscapes and seascapes and portraits, you must expect to meet up with a lot of criticism that is going to "burn you up," particularly if YOU yourself like what you've made.

There are two *very* important rules one must master in every picture he brings in, i.e., CRITICAL FOCUS AND CORRECT EXPOSURE, no matter what the subject may be, and, there is a third rule that is good to remember. Each time you "shoot" make a better picture than the one you made before. Learn to know the mistakes that have been made and don't repeat them. Don't try to be "cock-sure." If there is a doubt in your mind about the proper procedure, take time to study the problem, analyze it, don't waste film thoughtlessly.

There is no finer hobby or pursuit of happiness than the pursuit of photographic perfection. No matter what you "shoot," strive for improvement. It is the constant desire to achieve perfection that makes photography an interesting hobby.

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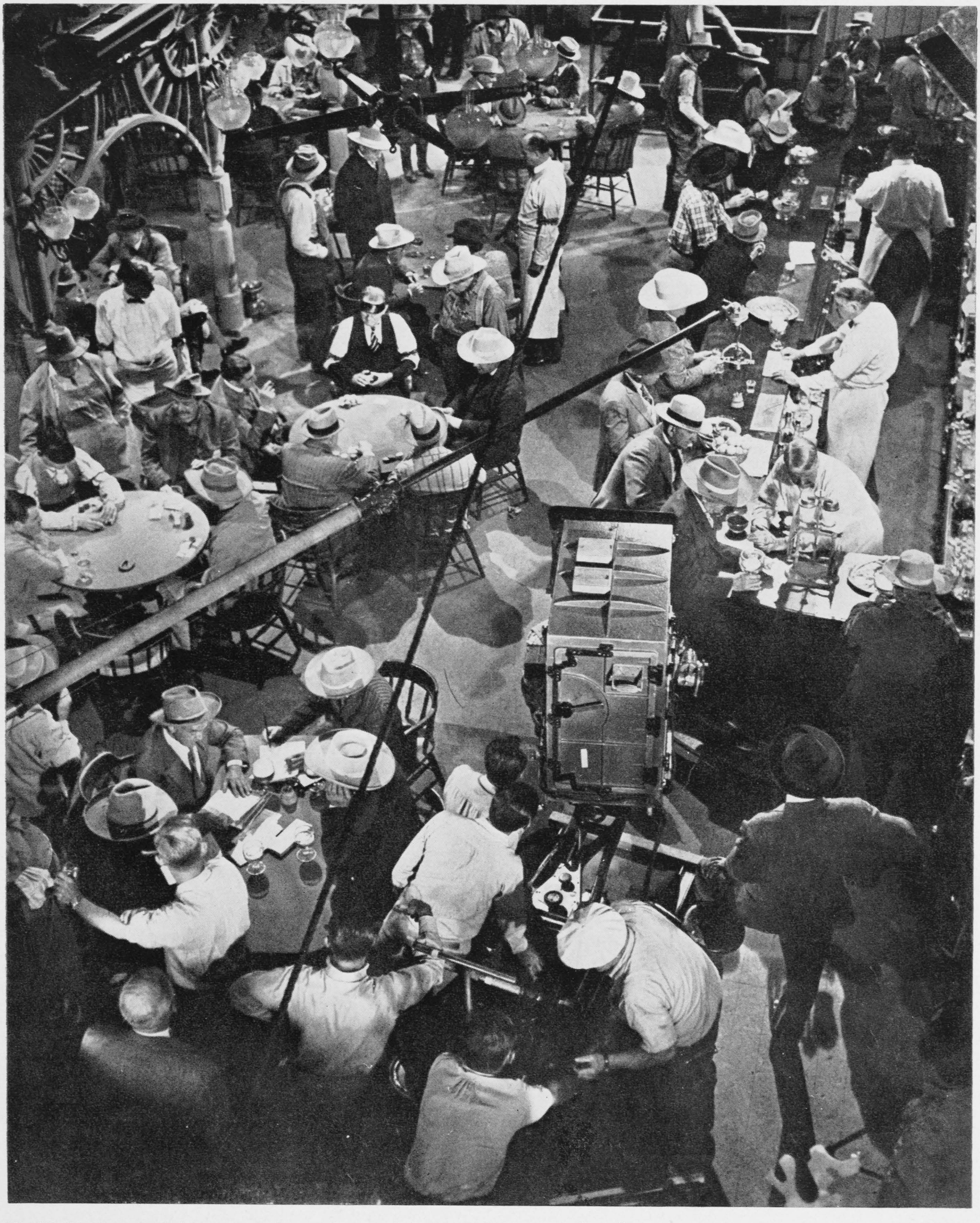

ON THE SET—This scene depicts a western nitery at the turn of the century, in Paramount's "Incendiary Blonde". In it Betty Hutton portrays Texas Guinan. The film is a musical in Technicolor, co-starring Miss Hutton and Arturo DeCordova. Photograph was made by Bud Fraker.

China Fights With Films, Too

By ROBERT JOSEPH

CHINA, which has been fighting the fascist aggressor for seven years at great odds, numbers motion pictures among its weapons. As its Armies, trained and equipped in part by the Allies, sweep across China to meet the Japanese foe, like its American, British and Russian Allies, is using films to educate its people, train its soldiery and entertain its citizens.

The Chinese motion picture industry survives today as another example of the resilience, resourcefulness and ingenuity of its people. Chinese leaders—Generalissimo Chiang Kai Shek and others, early realized the importance of motion pictures. Studios, if they may be called that in comparison to their Hollywood counterpart, were literally dug out of rock and soil. When the Japanese started to bomb Chungking, home of the Central Film Studios, the Chinese started going underground, and now studios and projection rooms exist twenty and thirty feet underground, safe from overhead danger.

"During the bombing season," Dr. Kinn Wei Shaw, representing the United States-China Film Exchange, stated on his arrival in the United States two years ago, "which seems to be always, the film companies work near the dugout entrances while there are no planes in the skv. But then they come—and swiftlv—almost mechanically the workers disappear into the well-ventilated dugouts where they resume their work without further interruption. Some mornings they start working right in the underground part—because they are sure an attack is coming. And usually they are right."

Some times during bombing hours the actors and their director spend their time rehearsing their lines, going over scenes. This offers the advantage of adequate rehearsal, and the Chinese directors pride themselves on the speed with which they work and the absence of retakes and repeated shooting of the same sequence. Rehearsals coupled with the fact that negative in China is at a premium together make Chinese pictures of a very high calibre.

The Chinese Government interested itself early in the problems of film production as well as film exhibition. In the three-year period between 1937 and 1940 some 135 feature-length productions were made, a schedule which compares favorably with those of such technically advanced in the film field countries like Sweden, Spain and Mexico. At present there are three "major" studios: The Central Film Studio, which concentrates on newsreels and educational shorts for the public; China Film Studios which makes documentaries for the Army; and the Chinese Educational Film Studio which is making subjects for schools and colleges. Entertainment films as we know them in this country do not exist. Films are made with propaganda intent. To paraphrase a spokesman on this subject: "Film and time are too precious for China to lavish them on pure entertainment that does nothing for China's war effort. Every film which is made in China today must be made to educate, to train, to instill patriotism and the will to win." As reported in the "Foreign Commerce Weekly" Chinese films must serve one or more of the following functions:

1. Develop national consciousness
2. Teach industrial techniques
3. Impart scientific knowledge
4. Impart general knowledge
5. Supplement school curricula

The first regular theatre was opened in China in 1912, an early start for the Chinese film industry, and not very far behind many European countries. By 1927 there were 106 motion picture houses in China. However, since electricity was unknown in the interior provinces of China further expansion was not posible. Nevertheless in the ten years that followed China built an additional 200 houses. Because of the Japanese invasion in 1937 and occupation since most of these houses have fallen out of Chinese hands.

The Chinese are fans in very much the same spirit which pervades American fans. They have their screen favorites, and seem inclined toward action melodramas. Musicals are next, and then the classical and semi-classical films. Technicolor pictures are popular, as is, of course, that international character, Mickey Mouse and his animated counterparts. Problem pictures are not appreciated because they are not understood by Chinese; problem pictures dealing with purely local issues and controversies, that is.

Major problem of exhibition in China, aside from the crucial one of a theatre shortage, is the question of importation. "The Hump," as it is called, the air run from India into China, is well traveled these days; but plane space is given over almost entirely to the immediate needs of war: ammunition, armaments, military technicians, with little space left over for other war essentials. Yet the Chinese Government realizes the importance of motion pictures in its war effort. The law permits the import of 50 kilograms of film each month from each of several agencies operating in India. The Soviet Union has also been supplying from its bases north of China newsreels, training films and documentaries to supplement this thin Chinese film fare. In 1940, the last year for which complete figures are available, Chinese imports from the United States totaled 1,919,422 linear feet, valued at $31,244. One of the devices used in getting films into China over and above the permitted 50 kilograms is to persuade travelers flying "The Hump" into China to include a few reels as part of their allotted luggage. Most of the pictures being shown in China are at least two years old, and most of them are films which enjoyed a wide popularity in this country. Because of this shortage repeated runs enjoy good business, and Chinese audiences see the same film as many as six and seven times.

In all of Free China there are somewhere near 2500 projectors for both 16 and 35mm films. Because of the preponderance of Chinese produced films in China most of the available screen time is taken up with native-made films. The films themselves are deliberately slow so that the information and propaganda content can be fully absorbed by Chinese audiences. In some cases, where the subject matter is complex, specially written pamphlets are distributed before the showing, and, on occasion, lectures accompany their films. In addition to the several thousand projectors, there are also a number of mobile units, some twenty-five in number, now operating in Free China.

In general China is more movie-concious than ever before. Since 1937 motion pictures have played an increasingly significant part in China's national life, and evidence indicates that this country should be a good market for American-made films in the post-war world.

As nowhere else in the world China is proving the value of films in fighting the enemy. Chinese peasants and city dwellers who were in ignorance about China's war aims and the hope for her future welfare, have become aware of what this war is all about. The advantages of the motion picture as an instrument of propaganda for the good, as the Allies see it, is best demonstrated in the resurgence of national pride and dignity as a result of the wide-spread Chinese motion picture program, limited as it is by shortages, lack of facilities and lack of technicians.

OUTSTANDING—

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FILMS

American Taste In Screen Heroes Is Changing

THE American taste in motion picture heroes is changing, according to reports submitted by a staff charged with the duty of selecting films for preservation in the Library of Congress. The Library's film selectors have been struck by the fact that a number of war pictures found their heroes, this last year, in groups rather than individuals. The selectors also believe they have observed a tendency in certain war pictures to turn reformed criminals into heroes of the battlefield.

These and other generalizations are made by a staff engaged at the Museum of Modern Art in New York in selecting the films which are to be recommended to the Library of Congres for preservation. The Library makes no effort to preserve the "best" films made during a given year. Rather, its purpose is to chose for preservation those films which best record, in one way or another, the life and tastes and preferences of the American people during the period in question. Thus news films, and other films which present actual events, people, and places, are selected because of their documentary significance. Again, films which deal with problems of outstanding topical significance during the period under review are chosen for the light they throw upon the intellectual preoccupations of the Americans of the time. In a similar way, films which have grossed unusually large box office receipts, or which have won prizes of one kind or another, are preserved as indications of the taste of the time. Other films are preserved for reasons having to do with the motion picture art itself, as, for example, films which indicate new trends, or deviations in the substance or technique of motion picture production, films which illustrate technical innovations of importance, and films which, regardless of their integral value, contain outstanding performances by individual actors or groups of actors.

The selection of films by the Library of Congress is forced upon it by its lack of storage facilities. The Library is entitled, under the terms of the Copyright Act, to two copies of every title registered for copyright, films being included in the coverage of the Act. Ideally, the Library would preserve all films of any significance whatever, as it now preserves all books which may have interest or significance to future readers and scholars. A lack of storage space for nitrate film has made it impossible, however, for the Library to preserve copies of films in past years, and the same lack of storage space and necessary facilities has compelled the Library to adopt a highly selective, rather than an inclusive acquisitions policy at the present time. Even the present limited policy has been made possible only through the generosity and imagination of the Rockefeller Foundation, which readily appreciated that the inability of the Library to preserve copies of films meant a serious and, in some cases, an irremediable loss to the people of the United States, and partciularly to future American generations, which will undoubtedly feel a considerable interest in the pictorial records of these years.

The Foundation's grant, which enables the Library of Congress to employ a staff of viewers and selectors in New York and to rent vaults in which the selected films may be stored, expires in the spring of 1945. Meantime, however, the Librarian of Congress and the Archivist of the United States, acting under instructions from the President, and assisted by the architects and engineers of the Public Buildings Administration, have prepared preliminary plans and specifications for a central film depository which, if formally authorized, will be constructed at some point in the neighborhood of Washington and administered by the Library of Congress.

It is expected that the general conclusions of the Library's selectors as to the current American film output will be published in a forth-coming issue of the Library of Congress' Quarterly Journal of Current Acquisitions. Since the film selectors are obliged, in performance of their duties, to see all commercial films and to make recommendations of one kind or another with reference to each of them, their over-all view of the year's production will undoubtedly have its interest to sociologists and historians, as well as to critics and amateurs of the motion picture.

Certain of the preliminary reactions of the staff, in addition to their over-all comment on the motion picture hero of the year 1943-1944, have already been reported to the Library. The selectors have been struck by an increase in the use of narrative commentary, in place of dramatic dialogue, in feature films and in cartoons: a development apparently borrowed from the documentary film. They have noticed also a marked increase and technical improvement in the use of 16 mm color film "blown up" and used as 35 mm—as, for example, in "Memphis Belle."

In terms of the substance of the year's films, the selectors believe they have observed several tendencies of interest. For one thing, cartoons and slapstick comedies have made use of an anarchic and chaotic element not observed in such films in recent years. Again, there have been one or two attempts to use psychological material seriously and with intellectual as well as dramatic understanding.

Finally, one or two fiction films have summoned up the courage to question, though timidly and with a hasty and saving rationalization, the morality of certain aspects of commercialism.

Fairchild Praised By Armed Forces

Fairchild Camera & Instrument Corporation, New York, manufacturer of the bulk of all aircraft cameras used by the armed forces, has been commended by high officers of both the Army and the Navy on its field service organization, set up in all war theaters around the globe.

In a letter to the Fairchild company, Maj. Gen. O. P. Echols, assistant chief of air staff, material, maintenance and distribution, said:

"The Army Air Forces desires to express its appreciation to your company for the service rendered by your field service representatives assigned to training installations in this country and in combat theaters overseas. It also wishes to commend these men for their exceptional and meritorious achievements.

"These technicians have not only trained thousands of members of Army Air Forces ground crews in the proper maintenance of equipment made by your company, but through their observation of combat performance, have also been instrumental in indicating improved methods of manufacture and maintenance. Many of them have performed this essential service at great personal risk to themselves.

"The Army Air Forces regards these men as an indispensable element in the all-American team of flyers, mechanics, technicians and production workers who are helping us destroy the military and air power of Germany and Japan."

And from the Navy—

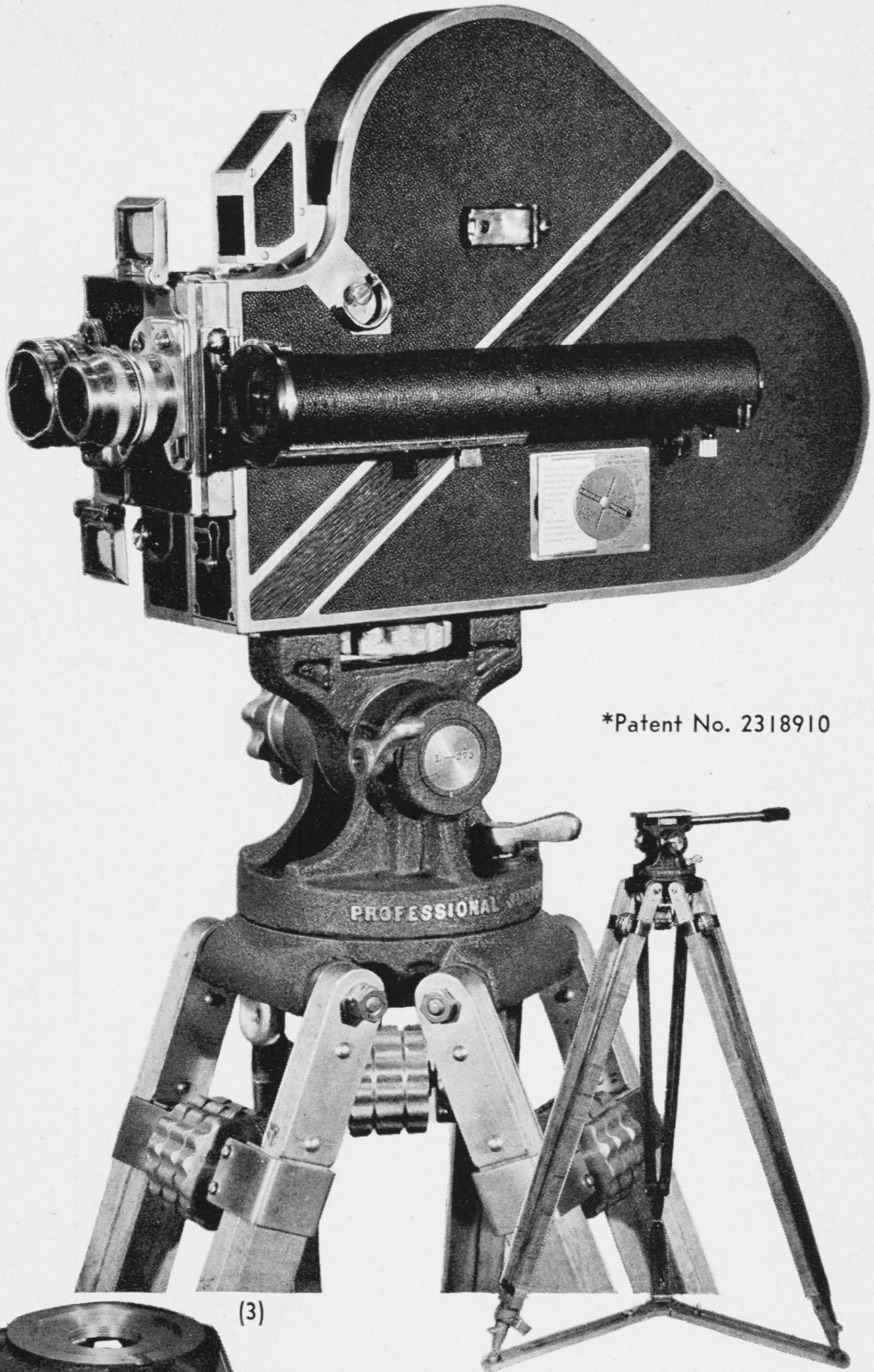
Commander R. O. Greene, commanding officer, Pacific Fleet Air Photographic Squadron One, reporting to Rear Admiral D. C. Ramsey, chief of the Bureau of Aeronautics, singled out Harrison L. Currey, a Fairchild technical representative, for praise. He said, "By his diligence, untiring effort, cheerful co-operation and through knowledge of his field, he contributed much to the final success of several highly important photographic reconnaissance missions over strategic Japanese-held territory."

Commenting on Commander Greene's remarks, Admiral Ramsey wrote the Fairchild company, "Reports reaching the Bureau of Aeronautics indicate that other Fairchild technical representatives are also doing splendid work. The cooperation of the Fairchild Corporation in furnishing such excellent representatives is much appreciated."

"PROFESSIONAL JUNIOR"* TRIPOD

with Removable Head

Acclaimed the finest for every picture taking use.

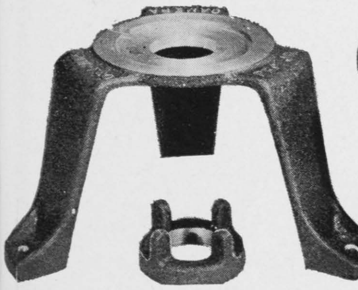

*Patent No. 2318910

The friction type head which is unconditionally guaranteed for 5 years, gives super-smooth 360° pan and 80° tilt action. It is removable, can be easily mounted on our "Hi-Hat" low-base adaptor or Baby "Professional Junior" Tripod base. The large pin and trunnion assures long, dependable service. A "T" level is attached. The top-plate can be set for 16mm. E. K. Cine Special, with or without motor; 35mm. DeVry and B & H Eyemo (with motor), and with or without alignment gauge.

The standard size tripod base is sturdy. "Spread-leg" design affords utmost rigidity and quick, positive height adjustments. Complete tripod weighs 14 lbs. Low height, at normal leg spread, 42". Extended height 72". All workmanship and materials are the finest.

ADAPTABILITY: below are illustrated (1) the "Hi-Hat" ready for the friction type "Professional Junior"* tripod head (2) to be affixed. Under the "Hi-Hat" is the finger-trip head fastening nut that firmly holds the removable tripod head onto either the "Hi-Hat," standard tripod (3) or "Professional Junior" Baby Tripod (4). Note the positive-locking, fluted, height-adjustment knobs and tie-down rings on the standard (3) tripod base. The Baby Tripod has a "T" level, weighs 5½ lbs., is made of Aluminum, with Dural legs having spurs. Extended height—21 inches, depressed—16 inches. It's compact and sturdy. Quality throughout.

(1)



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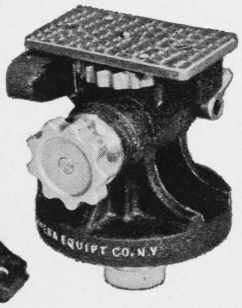

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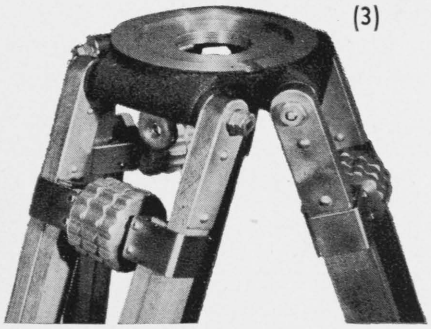


(4)

The new "Professional Junior" Baby Tripod, shown ready for the Removable Head.

"Professional Junior"* Tripods, Baby Tripods, Developing Kits, "Hi-Hats" and Shiftover Alignment Gauges made by Camera Equipment Co. are used by the U. S. Navy, Army Air Bases, Signal Corps, Office of Strategic Services and other Government Agencies—also by many leading Newsreel companies and 16mm. and 35mm. motion picture producers.

FRANK C. ZUCKER
CAMERA EQUIPMENT CO.
1600 BROADWAY NEW YORK CITY

High-Speed Cameras

(Continued from Page 373)

sures smooth starting of the film and prevents undue strain upon it. If all the resistance is withdrawn, the camera can be run up to a frequency of between 3,000 and 4,000 pictures per second.

The magazine contains a 100-foot length of 16mm. film on the standard daylight loading spool, the film running from the feed roll over a sprocket which is not rigidly attached to its shaft but is connected to it through a stiff helical spring. The film runs on its back surface through the gate, thence over a take-up sprocket to the friction clutch-driven take-up reel. The sprung feed sprocket ensures that the film is held taut in the exposure plane in the gate, and reduces still further any slight strain put on the film in starting. The importance of these precautions cannot be over-emphasized, for, when the camera is set to run at 3,000 pictures per second, the entire 100-foot length of film passes through it in under two seconds. The film is accelerated to over two-thirds of this maximum speed during the passage of the first 40 feet.

Two automatic switches are provided on the camera. One of these can be preset according to the length of film loaded into the magazine to switch off the current supply to the motor immediately the film has passed through the camera. If this precaution were not taken, the motor would speed up when the load on it was released, and would soon burn out or overheat the bearings unnecessarily. The second switch can be preset to operate at any given instant during the passage of the film to make or break an electric circuit. This can be used to facilitate synchronization between the camera and the action to be photographed, where this can be controlled electrically.

The lens normally supplied for use with this camera has a focal length of 2¼ inches and an aperture of f/2.7. It has coated surfaces to improve its transmission and increase the contrast in the image. A 2-inch f/1.6 lens and a 4¼-inch f/2.7 telephoto lens can also be supplied.

The view-finder is made to view directly through the film gate, in which a piece of matte film base may be placed to focus upon. The view-finder is thus completely free of parallax error. The front optical component of the finder can be set against stops in two positions. In the rear position the whole of the frame can be viewed, while in the forward position a highly magnified image of a small section in the center of the frame permits critical focusing.

A time base for use with this camera has been built in this country by H. Tinsley, Ltd., and is shown attached to the base of the camera in the photograph Fig. 3. It has been fully described elsewhere.[6] It consists essentially of an electrically maintained 500-cycle tuning fork bearing at the end of its prongs two slit shaped diaphragms. By means of a lamp and a suitable optical system, these slits, which form a shutter, are illuminated and an image of them is thrown onto the edge of the film. When the prongs of the fork vibrate, the light beam is interrupted one thousand times a second to produce a series of short dashes exposed alongside the pictures on the film. The time base can be supplied to operate either 115 volts A. C., or from a 12 volt battery.

The Fastax Camera

The Bell Telephone Laboratories "Fastax" high-speed motion picture camera has been described by Smith,[7] and is designed to use either 16mm. or 8mm. film, the latter in the double width as supplied for the standard "double-eight" cine cameras. With 16mm. film a square section glass prism is fitted. No shutter is used in this case, so that light can pass from the lens to the film when either of the two pairs of parallel faces of the square are suitably oriented with respect to the film. This allows the prism to be run at half the speed of that in the Kodak camera for a given picture frequency. The shutter mounted prism has, however, some advantage optically, in that the shutter restricts the angle of rotation over which the optical compensation obtained approaches the theoretically perfect. There is a consequent reduction in the time of exposure at a given picture frequency. When 8mm. film is used in the "Fastax" camera, an octagonal prism is fitted.

The "Fastax" camera is shown in the photograph Fig. 4, and the compactness and convenience of the design are noteworthy. The magazine accommodates up to 100 feet of 16mm. film on the standard daylight loading spool, whence it passes over a large toothed sprocket wheel which drives it, and upon which it is carried through the image plane of the lens and to the take-up spool. On 16mm. film it is possible to take pictures up to 4,000 per second. On the 8mm. film, 8,000 pictures per second can be taken, because, while this is passed through the camera at the same linear speed, the vertical height of the 8mm. frame is half that of the 16mm. frame, so that twice as many pictures are obtained on a given length of film.

A ground glass screen view-finder is fitted to view through an aperture in the large sprocket forming the film gate, by means of a small prism which is attached to the camera door and is placed in the correct position when the door is closed. This system is, of course, free of parallax error.

Intermittent Light Sources

The exposure time at a picture frequency of 3,000 per second is about 1/15,000 second for the Kodak camera, about 1/9,000 second for the "Fastax" 16mm. camera and 1/12,000 second for the "Fastax" 8mm. camera. For each camera it varies inversely as the picture frequency. These exposure times are relatively long and only made possible when

(Continued on Page 392)

ROHDE

MT/Sgt. Alfred W. Rohde, Jr., of the U. S. Marine Corps, who parlayed a pair of Texas cowboy boots and an idea for a motion picture camera design into world-wide fame, shown above shortly after the Marines completed their invasion of Guam.

Sergeant Rohde, who had kept his Texan boots constantly with him ever since he joined the Marines in 1937, wore them for good luck during the Guam invasion. He also wore them as a talisman when he competed in DeVry Corporation's 1944 Motion Picture Camera and Projector Design Competition. He carried off one of the top awards for his suggestions for motion picture camera refinements. He may have additional suggestions to offer as a result of his combat experience as an official Marine photographer.

"I am willing to risk the extra inches of the high heels in combat just to have a bit of Texas on my feet," declares Sgt. Rohde, "and also because the boots have always brought me good luck."

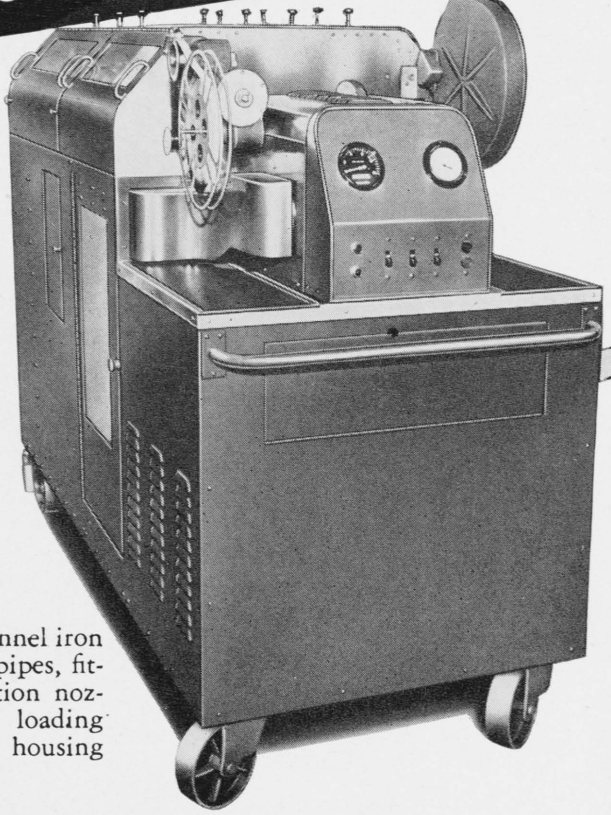
Sergeant Rohde has contributed a number of articles to the American Cinematographer.

Western Electric Announces Thermistor as New Product

The Western Electric Company has added the thermistor to its list of electronic and communications equipment now being manufactured for the Armed Forces. Like many other products that have come of age during this war, thermistors will have a vast number of peacetime applications in the electronic world of tomorrow.

MODEL 1 Houston

16 MM. REVERSAL FILM PROCESSOR

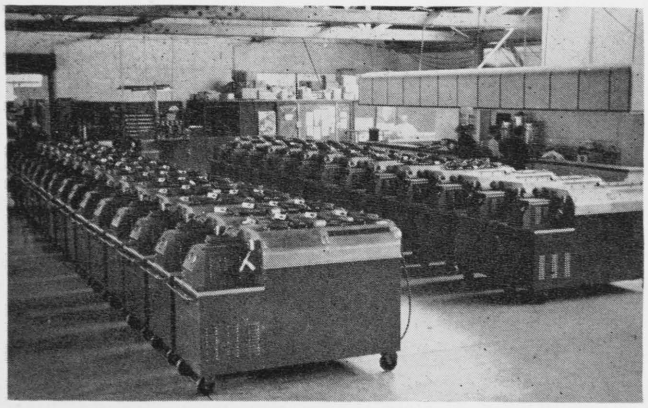


PRECISION-BUILT. Base of 3-in. channel iron and 10-gauge steel plate; shafts, pipes, fittings, brackets, bearings, turbulation nozzles and rods are stainless steel; loading flanges and brackets, and take-off housing of aluminum. 220 volts A.C.

Houston's Model 1 puts into action the most advanced methods of processing 16 mm. reversal film.

HANDLES COMPLETE JOB—Feeding, first developing, stop, negative exposure, bleaching, clearing, positive exposure, second developing, stop, fixing, washing, glycerine rinse, drying, footage measuring, winding on take-off reel.

PREDETERMINED MACHINE CONTROL—Temperature, agitation, film travel, and all other fixed or variable factors in film processing are under constant, positive control.



READY FOR SHIPMENT. Battery of Model 1's on Houston factory floor ready for crating and delivery to users.

UNIFORM RESULTS are assured. No guesswork; no substandard work.

SPEEDY VOLUME PRODUCTION—Delivers 600-900 ft. completely processed film at development times ranging from 2½ to 4½ min.

COMPACT, CONVENIENT, EASY TO OPERATE—Only 72 in. long, 52 in. high, 30 in. high. Mounted on casters for easy movement anywhere. Easy to operate. Loading and unloading can be done while machine is in operation. All chemicals needed for processing are supplied weighed, packaged, numbered and color-coded for easy, accurate mixing. Operator's instruction book is furnished with each machine.

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Houston

"RECORD IT ON FILM"

AMONG THE MOVIE CLUBS

Attention, Publicists!

With considerable interest we note that on the official stationery of most of the amateur clubs there is usually listed the name of one person designated as handling the club's publicity.

We often wonder why such names are so listed, for, with very few exceptions the club news that finds its way to the desk of this editor comes from the secretary, sometimes the president, of the various clubs. Many clubs send in their news a month late. This month, for example, we received a report of the September meeting of one club just as we were closing the forms of our November issue. Quite naturally, we could not use such stale news.

Don't you club members think it would be a good idea for your members handling your publicity to really get to work and get it out on time. Closing date for copy for this magazine is the fifteenth of the month preceding publication. In other words, copy to appear in the December issue should reach our desk by the fifteenth of November.—The Editor.

Syracuse Club

Members of the Syracuse Movie Makers held its October meeting in the new club house which it has acquired, complete with dark room, auditorium and all the things movie clubs dream of some day having.

On the program were "The Hollow Idol", "Hurricane", "Simple Religion" and "Beyond Manila." Members of other amateur clubs will undoubtedly be sorry to hear of the passing of Robert F. Kimber, who served as vice-president of the Syracuse Club for 1943-44. He started the publication of the club's "View Finder."

Brooklyn Club

The Brooklyn Amateur Cine Club held two meetings in October. The first was a more or less general get together. At the second meeting two unusually fine films were screened. They were "Dream of a Faun," and "My Native Land." These films were both made by Jordan C. Smith, and won prizes at the Mineola Fair. One of the features of the program were the unusual records Mr. Smith made to accompany the films.

Welcome, Aurora

The Aurora Cine Club, of Aurora, Illinois, has just been formed. The club plans to hold two meetings each month. LeRoy F. Wise has been named president, and E. O. Wise, secretary.

Los Angeles Cinema Club

The October meeting of the Los Angeles Cinema Club proved to be one of the most interesting in the history of the club, due to the screening of 2000 feet of Kodachrome, made by Mrs. Hoyt Mitchell of Los Angeles. Mrs. Mitchell was touring Europe just before the present war broke out in 1939. She made beautiful pictures of the Mediterranean and North Africa areas as well as pictures of Norway and France. She took her last picture in Europe the day before war was declared. Those pictures were right along the German border where our troops are fighting today. Mrs Mitchell gave a brilliant commentary as the film was screened.

Guy Haselton screened a very beautiful Kodachrome subject called, "Canadian Rockies and Blooming Desert."

M.M.P.C.

"The Birth of St. Mary's," photographed by Robert Gowen of Ossining, N. Y., was the highlight of the October meeting of the Metropolitan Motion Picture Club of New York City. This film was judged one of the Best Ten in 1938, and describes how a town planned the building of a church, and how the plans were executed.

Also on the program were "Moloch of Erebus," a Kodachrome subject made by Mr. Gowen, and "Backyard Victory Garden," by F. Clark Tufaro. It shows how a flower garden was transferred into a victory garden. Scenes of the club picnic were also shown.

San Francisco Club

Three unusual films featured the October meeting of the Cinema Club of San Francisco, held at the Women's City Club. They were: "Lassen Volcanic National Park" and "Exotic Flowers of Santa Barbara", both by Leon Gagne, and an interesting film in color of the recent Marin County Horse Show.

The horse show film was made by a combination of four members of the club, and clearly demonstrated the kind of team work required in filming an event of character by photographers working from different locations.

Philadelphia Cinema Club

Four films, quite different from those usually shown at amateur club meetings, made up an interesting program for the October meeting of the Philadelphia Cinema Club. The films were: "Among the Silk Route," "News of the Air," "Tarawa", and "Your Ships in Action." The program made a distinct impression on the club members.

Saint Louis Club

Cinematographic highlight of the October meeting of the Amateur Motion Picture Club of St. Louis was the Kodachrome film, "Close-Ups", by Werner Henze. This film was made up from a series of random shots Mr. Henze has made of flowers, insects and animals over the last four years. It proved beyond a doubt the value of close-ups in the making of motion pictures.

Also on the program were two films made by Mrs. W. C. S. Becker. They were "Movie Vacation Trip to Yellowstone National Park", and "San Francisco's World's Fair 1939-40." Both were excellent subjects. As the closing feature of the meeting, Lon Wadman gave an interesting talk on how to arrange shooting scripts.

La Casa Club

Capacity crowds continue to be the rule at the meeting of the La Casa Movie Club of Alhambra, California. More than 200 attended the October meeting at which four films were screened. The pictures shown were:

"Rambling Around the Southwest" by John Cook; "All Aboard for Rochester" by John F. Clay; "A Florida Holiday" by James R. Hornaday; and "Mexico" by C. L. Lefiell. Preceding the meeting, close to 100 members met for dinner.

Washington Club

At its October meeting the Washington Society of Amateur Cinematographers opened its meeting with the screening of an up-to-the-minute newsreel. This was followed by an 8 mm feature of unusual excellence, "City of Destiny," photographed by Theodore Sarchin. Theodore Huff, film consultant and critic for the Washington Workshop, gave a short talk, and the meeting concluded with a general discussion.

THE recent theft of thousands of dollars worth of photographic equipment from the home of Len H. Roos, A.S.C., should move owners of cameras and camera equipment to have all such equipment insured against theft. Mr. Roos had no insurance on his equipment, so unless it is recovered he will take a huge loss. In his case the reason he had no insurance was because he was waiting for the arrival of more equipment from the South Pacific where he had been a war newsreel correspondent.

But in the case of hundreds of owners of expensive equipment it is negligence. They think no one will steal their cameras. Don't take that chance. Get insurance today on all your equipment and be safe.

A combat cameraman of the U. S. Army Air Forces was decorated for his part in the first Ploesti oil field raid.

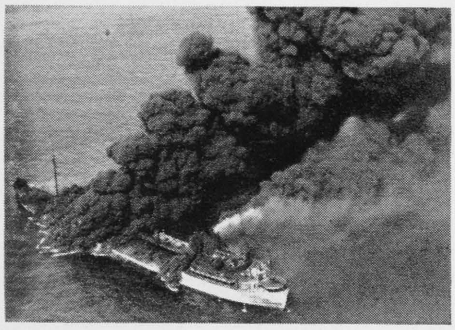
They're flying...fighting... behind a movie camera

ARMY Air Forces Combat Camera Units are making a superb motion-picture record of the air war on the fronts all over the world. Naturally, many men from the motion picture industry have become combat photographers.

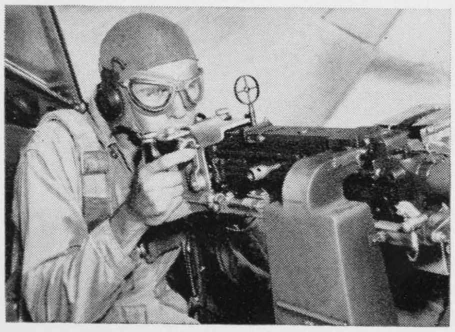
Many more make up—in large part—the First Motion Picture Unit, the training branch of the AAF Motion Picture Services. This unit has two main functions: making training films which help turn out in a hurry thousands of expert pilots, navigators, armorers, and mechanics; and the intensive coaching of hundreds of motion-picture photographers who make up the Combat Camera Units.

And the cameramen do not work alone. They are supported by a host of writers, cutters, sound and music editors, laboratory and other technicians.

There isn't space for a tenth of the story, but the net of it is that the motion-picture industry has reason to be proud of its share in the pictorial record of our Army Air Forces.



Evidence of a direct hit



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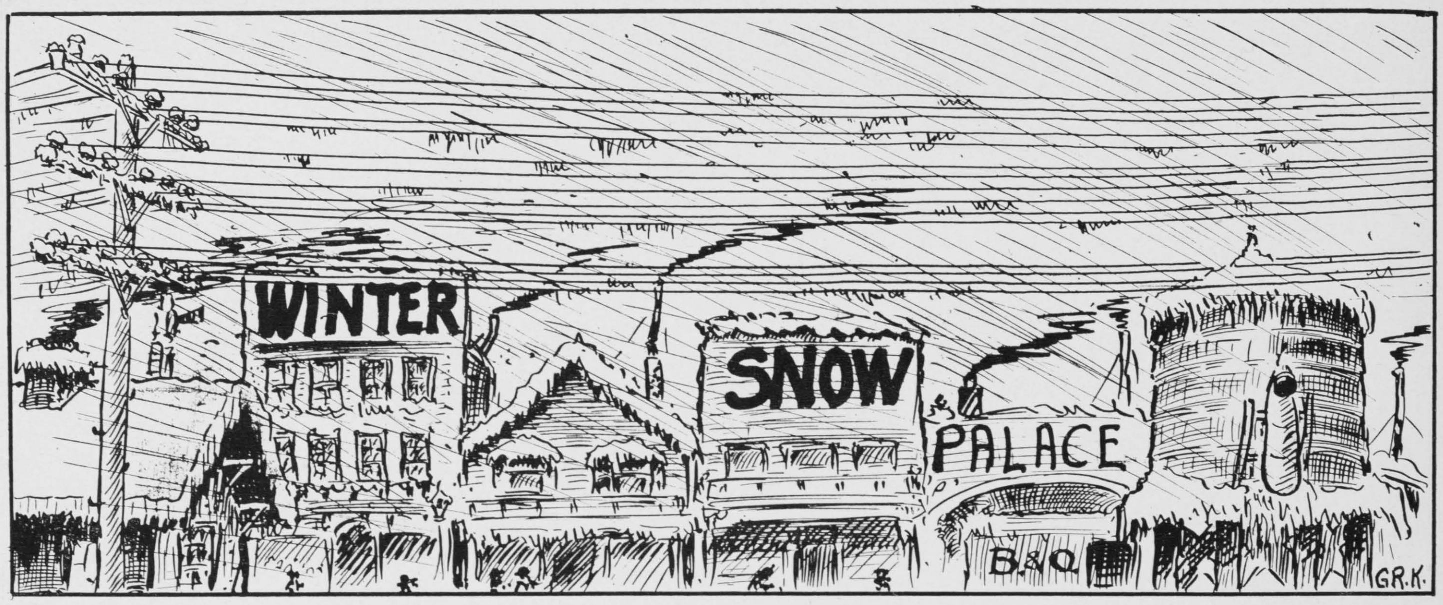
Official Photographs: U. S. Army Air Forces, U. S. Navy



Filming in the Snow

By GLENN R. KERSHNER, A. S. C.

THROUGHOUT the ages poets have painted word pictures of the beauty of winter snow, but I feel sure that, beautiful as many of their poems have been, they never can be as beautiful as the motion pictures which can be made of delightful snow scenes. Every home movie maker has at his command the tool that can make a lasting record of winter. Winter with all its grandeur . . . snow storms . . . frosted house tops . . . frosted windows . . . frozen rivers and lakes.

The very thought of the many charming scenes makes a camera enthusiast thrill with the thought of pointing his camera toward white blanketed fields that sweep on to the horizon, with here and there a snow capped fence, a lonely barn or a grotesque leafless tree that casts a picturesque shadow on the snow. Yes, winter holds much for the amateur movie maker.

In looking through my old diaries when I was a newsreel photographer, I find that November usually found me working my way north toward the New England states, Colorado or Canada to capture the first big snow storms. The public like them on the screen.

I'm sure you 16mm and 8mm owners are looking forward as much as I did for the first big snow storm. So, be sure that your cameras are well cleaned and oiled. Redress your camera cases so they will resist melting snow and water. Take a mixture of linseed oil and turpentine, half and half, and heat it. Then with a small brush, paint the legs of your tripod. This will preserve them and prevent them from swelling and sticking. It also is a good idea to saddle soap your camera carrier straps.

No doubt your camera cases have had quite a bit of rough handling in the summer, and considerable dirt and dust has gathered on the lining. Make it a point to give the cases a good cleaning, and glue fast any torn lining. With everything in shipshape, you are now ready for winter filming.

Winter, with its snow and ice, has always fascinated me, whether it was ice covered falls of Niagara, sled races in Canada, or frost covered trees in the Yosemite. However, I was never satisfied with my snow pictures until I went to the Arctic with the Donald B. MacMillan Expedition. I used multicolor film on that trip, and after months in that region we brought back forty thousand feet of color film. The color I used was a bi-pack, and it was beautiful.

Right now I wish to say that if you are using Kodachrome for your snow shooting you do not need to worry about filters. If properly exposed you will get excellent pictures. But if you are using black-and-white film, then you better watch your filters.

As a rule, filters for amateurs are composed of four kinds: red, green and two ambers. They are designated as either two time or four time filters, and sometimes the designation is preceded by the letter "P," which means the filter is corrected for panchromatic film. These filters have been simplified so that amateurs will know that when using a two-time it requires one more stop for light, and two stops for the four time.

Very often included in an amateur's kit are the two filters, Coral-pink and the blue. These are to be used with the two types of Kodachrome film. The Coral-pink is used when shooting interior Kodachrome, Type A, outside in sunlight. The blue filter is used when shooting regular Kodachrome under artificial light.

To the advanced amateur all of the professional filters are available for use with the 16mm equipment. Several types of sunshades and mat-boxes are available for those who wish to use the professional filters.

If you are using black-and-white panchromatic film for snow scenes, and wish to use the same kinds of filters the professional uses, you should carry the following: Aero No. 1 and No. 2, 15-G,23A, 56B and 50% Neutral. Some of these are used separately, and some in combinations. First, let me explain what each filter will do, and then give the filter factor and how many stops to open from normal. In other words, should you select F16 as your normal stop and you wish to darken the sky for cloud effects, you select the 23A filter, a red filter with a factor of 4, which will mean that you have to open the lens 2 stops more for the full exposure. Then you would open the diaphragm up to F8.

The Aero 1, very light amber, has a slight color correction for all types of Panchromatic films; produces slight contrast, penetrates slight haze and helps to snap up faces. It has a factor of 1.25, so open one-fourth more stop.

Aero 2, light amber, Normal correction for all types of Panchromatic film. It produces medium contrast, darkens blue sky a few shades, brings out clouds and penetrates haze deeper than Aero 1. Factor is 1.50. Open lens one-half stop more.

15G, yellow. Full color correction, produces more contrast than Aero 2, and is very good on open landscapes. It darkens the sky a little, bringing out the clouds. It lightens all yellows, orange and red, and slightly lightens green and magenta colors. The factor is 3, so open lens 1½ stops more than normal.

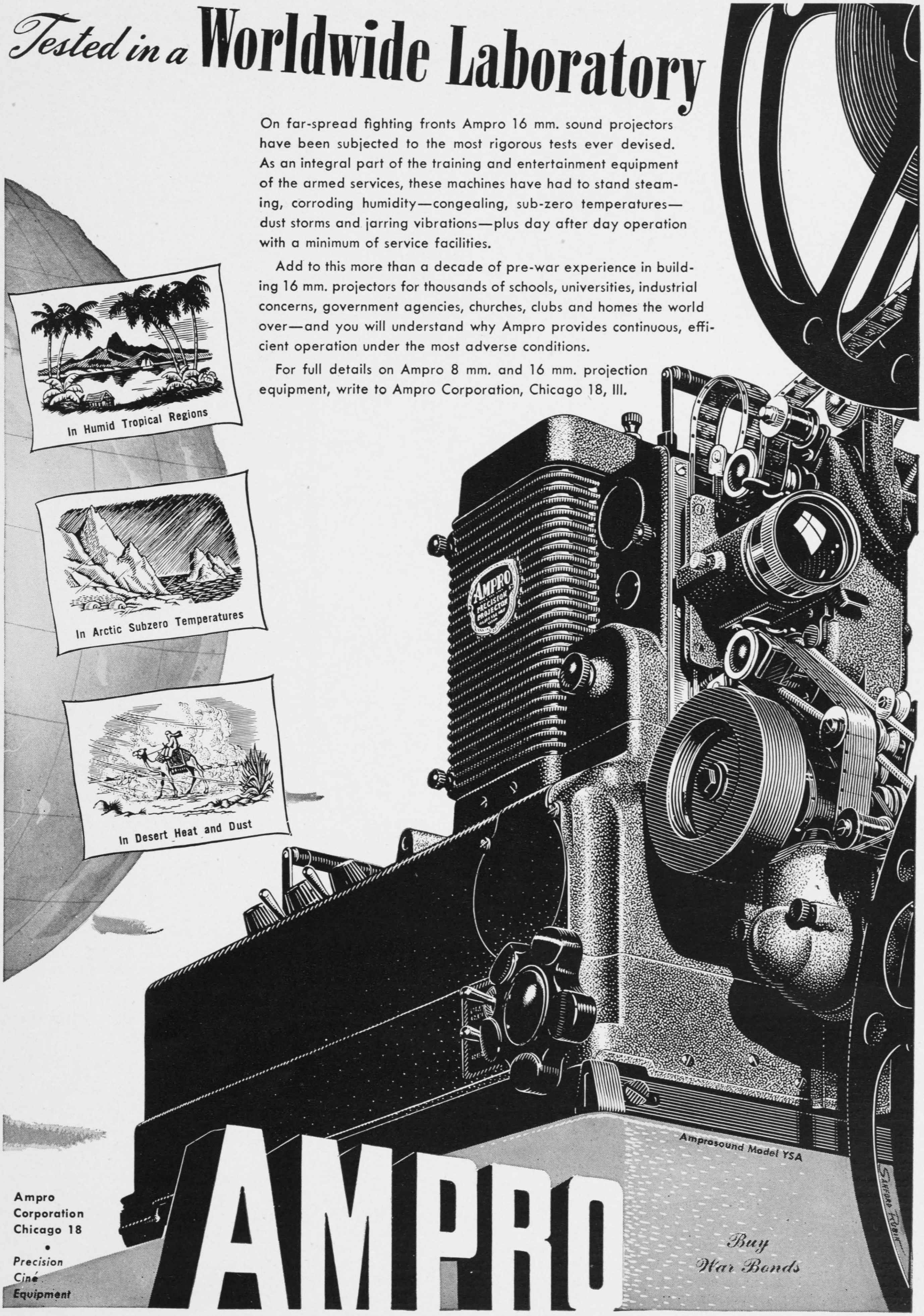
(Continued on Page 387)

Tested in a Worldwide Laboratory

On far-spread fighting fronts Ampro 16 mm. sound projectors have been subjected to the most rigorous tests ever devised. As an integral part of the training and entertainment equipment of the armed services, these machines have had to stand steaming, corroding humidity—congealing, sub-zero temperatures—dust storms and jarring vibrations—plus day after day operation with a minimum of service facilities.

Add to this more than a decade of pre-war experience in building 16 mm. projectors for thousands of schools, universities, industrial concerns, government agencies, churches, clubs and homes the world over—and you will understand why Ampro provides continuous, efficient operation under the most adverse conditions.

For full details on Ampro 8 mm. and 16 mm. projection equipment, write to Ampro Corporation, Chicago 18, Ill.



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New Theatrical-Television Firm Being Organized

GEORGE A. HIRLIMAN has announced that he, in association with a group headed by Eliot Hyman, President of Microstat Corporation, are organizing International Theatrical and Television Corporation with a contemplated capital basis of $1,000,000 in common stock and $5,000,000 in preferred stock.

The activities of the Corporation will be centered around the post-war development and expansion of the 16 mm industry. Negoitations with General Aircraft Equipment Company for the manufacture of 16 mm projectors and television equipment are now in the process of completion. Circle Film Laboratories will be affiliated with the new company for the express purpose of handling the new company's laboratory printing.

It is not only the plan, but the announced purpose of International Theatrical and Television Corporation to develop the 16 mm field to its widest potentialities and to augment it by eventually tying in the practical application of television as well. The importance of the new organization is manifested in the fact that it will be able to manufacture and market, at moderate prices, its own 16 mm projector and television equipment in four different models, ranging from home to auditorium use.

J. Harold Booth

BELL & HOWELL COMPANY, pioneer in its field in motion picture equipment, with the appointment of J. Harold Booth as Vice President in Charge of Merchandising, takes another step forward in postwar planning.

Although currently engaged almost entirely in war production, and not losing sight for a moment of the importance of continuing an uninterrupted flow of supplies to the armed forces, Bell & Howell nevertheless realizes the necessity for planning now to insure continued employment during the reconversion period ahead. Mr. Booth's 16 years with the Company, in engineering, sales, and executive capacities, will fit him for his new responsibilities, and under his recognized and able guidance plans are already emerging from the formative stages into a working design for postwar merchandising.

Call to Arms for the Dutch

A film has been produced to be used in Holland—when that country is liberated—to recruit men for the allied offensive against Japan. It was previewed in Melbourne on September 14. Made under the auspices of the Netherlands Indies Government Information Service, the picture will be shown throughout liberated Holland under the title, "Indie Roept"—(The Indies are Calling). It appeals to Dutchmen to remember the heroism and sacrifices of the Netherlands forces that opposed the Japenese in 1942. Commentary is by the Dutch broadcaster, Onno Liebert.

Included in the film are a number of action shots of the guerrilla fighting on Timor Island culminating in scenes showing some of these veterans of the Timor campaign back in action with the allied troops that liberated Netherlands New Guinea.

Filming In The Snow

(Continued from Page 384)

23A, light red. Medium overcorrection, darkens blue sky and water for light night effects. Lightens the face, darkens greens slightly and lightens anything red or yellow. It has a factor of 4, so open lens 2 stops more.

56B, green. Has strong softening effect, and produces great green and yellow contrast. Factor of 5. Open lens 2¼ stops more. This is a very good filter to use on landscapes and snow, providing you can miss the sky as much as possible.

50% N.D. (Neutral). Medium contrast neutralizer; medium softening of glare and contrasts; medium exposure compensator (instead of stopping down lens). Factor of 3. Open 1½ stops.

To darken the sky, bring out the clouds and lighten faces, as well as soften up the white of the snow and the shadows, we combine the 23A and 56B, making a combined factor of 9, so you should open the lens 3 full stops more than your normal reading. For a night effect (in sunlight) stopped down 1½ stops. Or, in other words, open up only 1½ stops above normal.

5N5 is a combination of Aero 2 and a 50% Neutral (N.D.) which gives medium color correction without excessive contrasts. It softens strong glare and contrasts. This is an excellent filter combination to use on snow, and strong contrasts with heavy shadows, and gives very pleasing values when used on open water scenes. Factor of 5, open 2¼ stops.

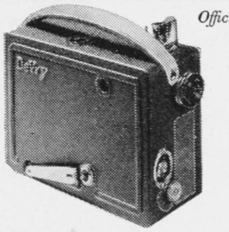
3N5 is a combination of Aero 1 and a 50% Neutral (N.D.). The Aero 1 slightly corrects the sky (clear blue sky), while the neutral lightly softens the whites. A very good combination. Factor of 4, open lens two more stops over normal.

These filters, I am sure, will give you very pleasing results with snow scenes. Quite naturally, you will have to study what each filter will do in its corrections, and then by studying the subject to be photographed you will soon learn what filter to use for your desired results. Of course, if you should wish to turn your snow scene into a night shot, allowing the faces and all red clothing, etc., to turn white as if it were moonlight, you can use a 29F filter. This is a very deep, red filter with extreme over-corrections giving an extreme contrast. It turns blue sky and water to a strong black, and should you wish to make medium shots and close-ups with it, you would have to use a special make-up with deep brown lips. However, in the closeups you should switch to a much lighter filter. Factor is 15, so open 3¼ stops from normal.

Last month I wrote about miniatures. Well, you can use miniature technique to enhance the value of some of your snow scenes. For example, if you would like to have icicles hanging from a window or the edge of a porch you can easily fix them up by using water-glass (the stuff we used to store eggs in). Mix this water-glass very thick, and with a spoon drip it onto the window ledge, tree branch, or whatever you wish, and there you will have perfect icicles. Try it sometime. If the weather is thawing and you want the icicles to be dripping water, just throw a little water on them and they will drip.

I hope the advice I have given will be of assistance to some of you readers. It won't be long until Christmas, so perhaps you had better begin to think about your Christmas Day filming. In the December issue I shall discuss Christmas tree photography, giving a few suggestions as to angles, etc.

Official British Battle Photographer with his DeVRY 35mm. Camera


DeVRY *16mm. Camera*

WHEREVER the fighting has been the thickest . . . wherever Allied arms have met their severest trials under fire . . . there DeVRY motion picture cameras have been found . . . doggedly grinding away to record the changing tides of battle . . . in living action and unforgettable sound.

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Ampere the Rate of Flow

The term ampere—the word used to express the rate of flow of electricity along a wire just as the term gallons per minute expresses the rate of flow of water through a pipe—was derived from the name Andre Ampere, French mathematician.

Fifty-four million cubic feet of coke oven gas are produced daily, for its own consumption, by the Rouge plant of the Ford Motor Company. That is enough to supply Detroit and its suburbs for 12 hours, and is in addition to similary quantities of blast furnace gas produced.

Reproduction of Color Sound Film

(Continued from Page 371)

a spectral distribution in the blue and violet part of the visible spectral region, is fulfilled not only by potassium oxide cells, which were studied mainly by Kluge,[8] but also by potassium hydride cells, studied by Elster and Geitel.[9] With respect to the total photoelectric sensitivity, however, even potassium oxide cells are not satisfactory.

It was therefore natural to adapt the caesium-antimony alloy cathode (Cs, Sb)[10] to meet the requirements of sound reproduction. This layer possesses high absolute sensitivity in addition to the desired spectral distribution (the long-wave maximum of sensitivity lies between 430 and 460 mμ). This is shown in Fig. 4. In this figure the product of $V_\lambda S_\lambda$ is plotted against wave length λ for the caesium oxide layer and also for the Cs, Sb layer. The integral

$$J_{ph} = c \int V_\lambda S_\lambda d\lambda$$

gives the photoelectric current expected from the spectral distribution V_λ and the energy distribution of the light source with known color temperature S_λ. Simultaneously, Fig 4 gives the thermoelectric current which must be measured for the reduction of data to the same incident energy.[11] Practical workers will be interested to know that it has been possible to make gas-filled photoelectric cells with Cs, Sb layer in production which, when measured in the light of a normal sound lamp heated with 4.5 amp, have a sensitivity of 250 μ A/Lm, which is similar to that of gas-filled caesium oxide cells. This indicates that the Cs, Sb cell can be used for the reproduction of a colored sound track as well as for the silver track, and therefore, has a gerat advantage over caesium oxide cells. It is to be expected that further investigations will show the way to make cells with still higher sensitivities.

The maximum of the spectral distribution may be shifted toward the red by about 100 mμ by sensitization with oxygen. Therefore, considerable specific adaptation to the spectral characteristics of any given film is possible. It will be of interest here to mention that even Schinzel's suggestion,[2] the use of a white sensitive cell, can be carried out practically. By combination of a transparent Cs, Sb layer with a caesium oxide layer[12] in one cell, a photocell can be made which has a uniform sensitivity over the entire visible spectrum up to the near infrared. However, this cell may be expensive, because its preparation requires the use of 2 different sensitization methods.

In spite of a multitude of publications,[7] it is not yet clear in all details what causes the gerat quantum efficiency of the Cs, Sb layers (maximum quantum efficiency of 30 per cent in comparison with 1 per cent with caesium oxide cathodes). It seems that the electrons are liberated in a polyatomic layer of an alloy Cs and Sb, whereby a fixed relation between both alloy components is necessary for the best results. In order to reduce the work function, a single-atomic Cs layer must be present on the surface of the alloy.

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Television to Revolutionize Future Selling Methods

THE ability of television to demonstrate a product will revolutionize merchandising methods, according to Jack A. Miller, Advertising and Sales Promotion Manager of the Standard Oil Company of New Jersey, speaking at the Television Seminar of the Radio Executive Club in New York. Another guest speaker was Carlos Franco, Manager of the Station Relations Department of the Young and Rubicam advertising agency.

"Like a lot of people in this war," Mr. Miller said, "television and the science of electronics have grown up fast. When peace is declared, television will be a force—a merchandising force—that must be recognized."

Mr. Miller illustrated by means of motion pictures how his company, the first to place a contract for a commercially sponsored series of programs prepared especially for television, has sold products and ideas by video broadcasting. In a demonstration of the making of synthetic rubber, Mr. Miller showed how interest and understanding of an advertising message can be doubled by television. He also explained how buyer confidence and desire can be built up by television demonstrations of a product.

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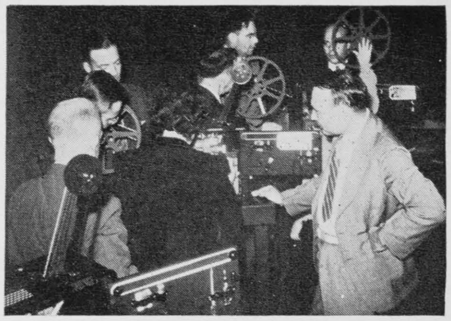
40 Tubes in Television Set

In some radio-television sets, there are as many as forty electronic tubes.



Churchmen obtain experience in operating Filmosound projectors at national visual education school operated by International Council of Religious Education.

Church Interest Grows in Movies

Church workers have long been interested in motion picture matters, though all too often their concern was a negative one, aimed at checking undesirable films in nearby theatres. Of late this interest has become more and more positive, and there are now so many prominent religious workers who use motion pictures in various phases of church work that the International Council of Religious Education recently conducted a summer school for visual education specialists. The course was attended by nearly 200 students from all parts of the United States. It was held at North Park College, Chicago, and lasted a week.

Besides utilization courses at various age levels, and work in the making of still photographs, there was a course on motion picture writing and production, conducted jointly by Rev. Wm. L. Rogers of the Religious Film Association and Wm. F. Kruse, manager of the Bell & Howell Films Division. A projection class was conducted by W. A. Moen, of the Bell & Howell Educational Division.

Photographic dealers have long been aware of the business possibilities of the church field, not alone in the form of direct sales to churches and other religious institutions but also in that of additional business done with laymen active both as amateur photographers and as church workers. This nationwide conference, which will be followed by many similar gatherings on a local scale, will stimulate church demand for film and photographic services.

Eight Million See Mine Bureau Films

THE free educational motion pictures of the Bureau of Mines were given almost 100,000 showings during 1943 before war training classes, Army and Navy personnel, engineering and scientific societies, schools, colleges, civic groups, and other organizations, according to a year-end report, just submitted to Secretary of the Interior Harold L. Ickes by Dr. R. R. Sayers, Director of the Bureau.

The gross attendance—nearly 8,000,000 persons—was slightly under the previous year, Dr. Sayers said, but the

Aces of the Camera

(Continued from Page 367)

Working under Pomeroy his first assignment was "The Ten Commandments," with the famous trick effect of the opening and closing of the Red Sea. Their joint success resulted in their working as a team. Together they developed a camera with which it was possible to take two identical negatives at the same time for the purpose of optically printing people on previously filmed backgrounds; thus anticipating the rear projection methods of today.

Rolla also helped in the early development of the Pomeroy Transparency Process which utilized a blue transparency image in front of the negative in the camera with the actors being photographed against a red background; a technical achievement in its day which foreshadowed many of the contemporary advances in process photography.

In 1924 he designed and built the first optical printer for the Paramount Studios, and with an eye for the smaller details as well as the big projects, invented, manufactured and sold a cap to fit over film magazine traps to eliminate the dirt hazard.

In 1928, when 20th Century Fox was the Fox Film Corp. they made a bid for the services of this enterprising and inventive technician, inviting him to come over and start an optical printing department for them. He has been there ever since.

During the intervening years he has grown with the industry, and is still experimenting and inventing the things that will make the motion picture of tomorrow as superior to the product of today as that of today is to yesterday's. He generates a feeling of confidence. The technical future of the industry is safe in the hands of such men.

One of his most spectacular effects in recent years was the sequence in "Footlight Serenade" in which Betty Grable danced and shadowboxed with her own immense shadow, which then stepped down from the screen behind her to conclude the number beside her. Rolla designed and directed the sequence, which he had to sell to a front office dubious of its technical probabilities, and then printed it on the special printer he had designed and built for such intricate split-screen and composite work.

Two or three years ago, for a picture entitled "Earthbound," starring Warner Baxter, he invented a devise that makes possible the shooting of ghost images at the same time as the main action. In other words, no double printing is necessary, the actors are arranged on the set, the camera trained on them, and at the same time the "ghost" performs against black velvet off to the side. With this devise it is possibble to make pan shots and dolly shots, and in addition, it is unnecessary for the actor playing the ghost to transpose action intended for his right hand to his left hand, and visa versa. As a picture "Earthbound" was not what could be called a howling success, but as an achievement in technical effects it was a masterpiece and with seventy-five per cent of the picture being concerned with ghost images it can be readily seen that Rolla's special ghost catching devise brought the picture in on schedule and within the budget.

The grand finale of "The Gang's All Here," with its kaleidoscopic colors and images, water curtain and floating faces is another spectacular achievement that can be chalked up to Fox's amazing "Director of Montages and Optical Effects." And yet he does not strive for the obviously spectacular. If it has to be done, he can usually figure out a way to do it. But he is more concerned with harnessing the science of special effects and trick photography to the broader purposes of making the motion picture a distinct medium, improving the product, and by a more general application of the principles of his special science making the problems of film production more simple and less expensive.

Early-Day Electric Meter

An early type of "alternating current meter," designed in 1887, made use of a paper spiral to indicate current consumption.

A scene from "Get Going", a Bell and Howell Filmosound Library release.

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Roos to Telefilm

Len Roos, veteran newsreel cameraman, lately war correspondent and member of A.S.C. has recently returned to civilian life and has been appointed by Telefilm Studios to act as Director of Photography, specializing in 16mm Kodachrome. Roos has had a wide and varied career in the newsreel field and has traveled in practically every country of the world. His pictures of December 7, 1941, at Honolulu were the first to be released in this country through Life Magazine. They described the holocaust of the City of Honolulu, Bellows and Hickham Field. Since December 7, 1941, Roos has been either in or in the vicinity of every major engagement fought in the Pacific and just previous to the Japanese attack of Pearl Harbor, established a film laboratory for the Dutch Government in Java.

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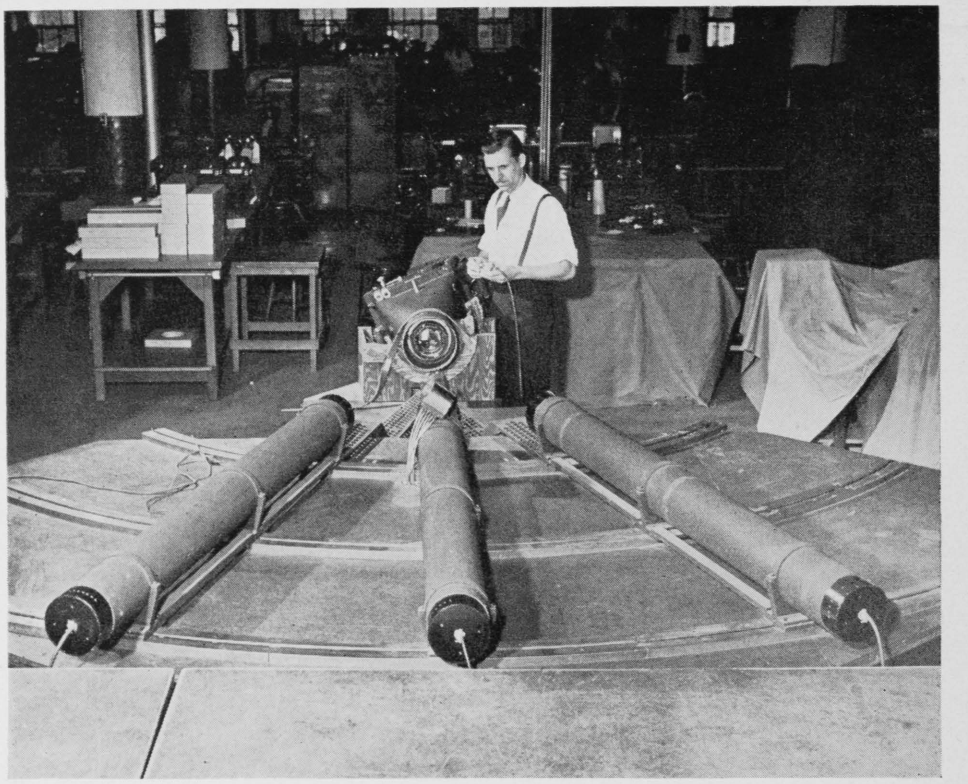

THIS fan shaped instrument is a lens collimator, especially designed by Fairchild Camera & Instrument Corporation engineers for the final testing of Fairchild aircraft camera lenses, after installation in the cameras. Installed in the company's plant at Jamaica, N. Y., its purpose is to give a photographic record of the resolving power of each lens, for correct focusing. Other tests, on other devices, are made, of course, before installation of lenses in the cameras.

A Fairchild model K-18 9" x 18" camera, with a 24-inch focal length lens, used by both the Army and Navy in military photography from the air, is shown mounted for testing. The two outer collimator tubes, each including a lens and an illuminated chart showing perpendicular reticle lines, swing out to cover the edge of the field of the lens, a matter that has often been neglected in ordinary focusing tests. The middle collimator tube, similarly equipped, covers the center of the field. The entire collimator, focused at infinity, transmits parallel rays of light to the camera lens for photographing on a test negative. Simultaneously, a small recording collimator, set atop the middle tube, records the serial number of the lens on the film. By means of this accumulated data on the negative the operator not only can determine the sharpness of detail covering the entire angle of view, but he can check any possible error from zero, and gauge the length of any such error.

New Filmosound Library Releases Announced

GET GOING (Universal)
No. 2548 6 reels

The housing shortage is only one of the hilarious aspects of this gay comedy of Washington's women in wartime, featuring Grace McDonald and Robert Paige. Available from December 25, for approved non-theatrical audiences.

THE LIFE OF THE ANT
No. 5800 1 reel

New nature-study sound film presents full life-cycle from egg to maturity. Remarkable microscopic photography shows development of embryo, and, later, details of jaws, legs, and other parts. Building and defense of homes, foraging, care of young and many other details well shown.

ALL BY MYSELF (Universal)
No. 2577 6 reels

Pleasant modern comedy with musical interludes. Two men, and an advertising agency, with a career girl in love with one man and pretending to be married to the other. (Rosemary Lane, Evelyn Ankers, Patric Knowles, Neil Hamilton). Available from December 11, for approved non-theatrical audiences.

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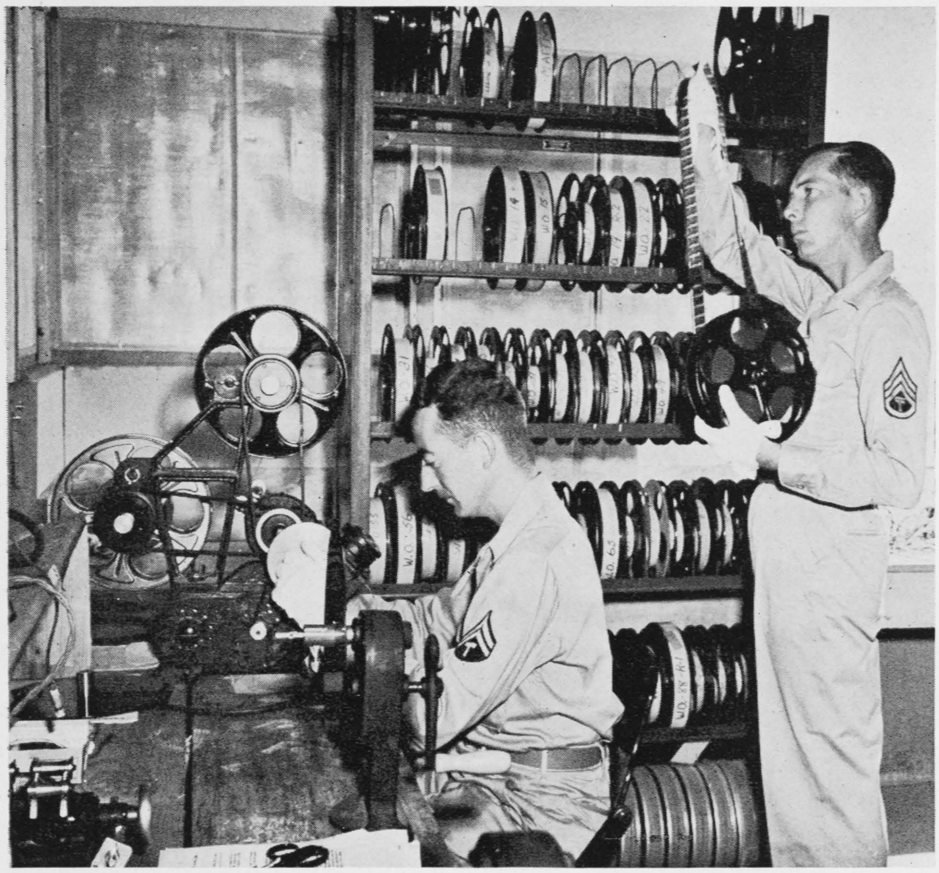

M/Sgt. Malcolm C. Bulloch (standing), and T/5 Rickey S. Daniels, at work in the editing room of the 4th Signal Service Unit in the South Pacific. Both men are from Hollywood's film industry. Photo by Sgt. F. L. Reed.

Army Laboratory Unit Gets New Name

THE 4th Signal Photographic Laboratory Unit, made up principally of enlisted reservists from the motion picture studios, now serving on New Caledonia, has been recently re-named by the War Department and will henceforth be known as the 4th Signal Service Unit (Photographic Laboratory).

Principal activity of the unit at present is production of a training film outlining various strategies and tactics of U. S. Army troops in the South Pacific. Production, to be made up from combat film shot during active fighting, with animation sequences and off-stage sound effects and dialogue recorded in the field, is being edited by M/Sgt. Malcolm C. Bulloch, formerly of Paramount studio, from a script written by T/3 Elmer L. Whiles, formerly of Warner Brothers, with animation sequences directed and drawn by Sgt. Philip de Lara, formerly of Leon Schlessinger Studios.

Overall production is under the direction of Major Gordon S. Mitchell, Commanding Officer of the Unit and formerly Manager of the Research Council of the Academy of Motion Picture Arts and Sciences.

England Saw the Light

On the most important uses of electricity was made in England in 1858. An arc lamp was placed in the South Foreland Lighthouse to guide the mariners in the stormy English channel.

New Educational Film Group Formed

EDUCATIONAL Film Producers' Association, New York City, a new production group in the educational film field, has just announced its incorporation.

Purposes of the Association as announced are: "To advance the study, understanding, and appreciation of educational, instructional and informative motion pictures; to foster, encourage, and promote the production and distribution of such motion pictures and to provide a clearing house for information pertaining to educational films."

Officers of Educational Film Producers' Association are: President, Fletcher Smith, Fletcher Smith Studios; Vice President, Max Lasky, Films of Industry; Secretary, John Flory, Grant, Flory and Williams, producers; Treasurer, Elda Hartley, Hartley Productions; and Chairman of the Executive Committee, Emerson Yorke, Emerson Yorke Studio.

In addition to the foregoing officers, charter members include Julien Bryan, Julien Bryan Pictures; Herbert Kerkow, Kerkow Productions, Inc.; John McCrory, Knowledge Builders; Clarence Schmidt, Spot Film Productions, Inc.; Ralph Schoolman, scenarist; C. O. Welch, Welch Productions; and Elizabeth Harding, Educational Film Library Association.

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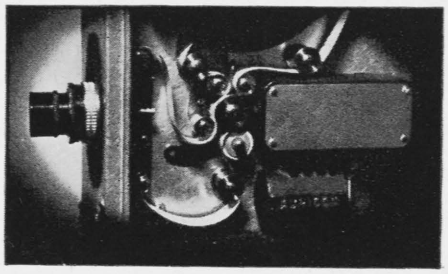

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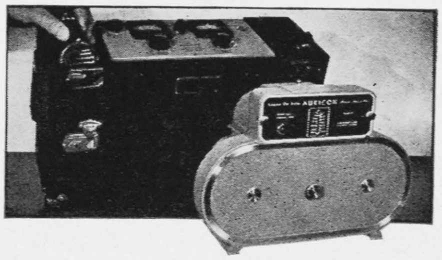

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High-Speed Cameras

(Continued from Page 380)

using continuously moving film by the optical compensation provided.

Even so, powerful batteries of high brightness tungsten projector lamps are needed to obtain the high level of illumination required for the production of well-exposed negatives. Experience has shown that some 20kw. of such lighting is required to illuminate quite small subjects satisfactorily, as the level of illumination required at the subject is between 10,000 and 100,000 foot-candles. For smaller subjects, and when shadow pictures are sufficient, specially designed optical systems provide more efficient means of illumination.

In cameras operating on the alternative principle in which no optical compensation is provided, the exposure time is so reduced that film movement during the exposure tending to impair definition is correspondingly reduce to negligible proportions. This system, first described by Marival[8] in 1931, and closely followed by Edgerton[9] and his collaborators in 1932, has since been developed to a high degree of perfection by the latter. A high brightness intermittent light source is used to illuminate the subject. The duration of the flash is controlled electrically through valve circuits, and the frequency of flashing is determined by a communtator on the film driving shaft in the camera, which operates through a thermionic trigger circuit.

The light source is a specially designed cold cathode gaseous discharge tube containing a mixture of krypton and xenon, and the gas pressure is so adjusted that its ionisation potential is just above the 2,000 volts applied to a condenser connected across the tube. A triggering impulse causes ionisation to start, accompanied by a brilliant flash of light as the condenser is discharged through the lamp. The camera is made to use 35mm. film. For satisfactory pictures to be taken up to a frequency of 1,500 per second, the flash duration cannot be longer than about 1/100,000 second if good definition is to be obtained. The exposure time for a given picture frequency is determined principally by the condenser capacity and the applied voltage, and, in general, the shorter the duration of the flash the less the energy or light output from it.

The size of the subject which can be photographed at high frequencies by this method is thus small, limited as it is by the amount of light available. The method has the further limitation that it cannot be used in daylight, or for self-luminous subjects. Rather more flicker is also sometimes noticeable during the projection of films taken by the stroboscopic light method due to the lack of reproducibility of the flash. The method has, however, the advantages of high electrical efficiency, as the light is only on for a short fraction of the total picture cycle, and so the subject is not exposed, even for a short time, to the heating which is inevitable with the other methods using batteries of high brightness tungsten projector lamps.

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USOE Optical Film Given Big Premiere

Under the auspices of the Navy and the United States Office of Education, Bell & Howell has produced a series of visual education units on "Optical Craftsmanship," using 16mm, sound motion pictures. The project was undertaken at the outbreak of the war to implement the large-scale expansion of American production of precision optics. No material had been previously available for the training of the unskilled hands that had to be drawn by the thousands into the infant industry.

The finished films were shown to a capacity audience which attended the premiere and evinced a special interest in watching the work illustrated in the set of six motion pictures. Many had helped create the movies in setting up the scenes, in performing the requisites of an operation in the production of fine optics, in cutting, editing or titling the films, or in doing any one of the many jobs necessary before the films were ready for release. Wm. F. Kruse, B&H Films Division Manager, was responsible for the production of this set of training films. Terrytoon and McCrory Studios produced the animated sequences.

The high professional standard and the educational excellence of these films based on hand and pin-bar rough grinding, pitch buttoning, and blocking was obvious to all who attended the premiere, and was commented upon by B&H President, J. H. McNabb, and USNR Lt. E. Gordon Watson, former B&H employee and now project officer in charge of a similar group of films under production for the Navy.

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Technical Papers Presented at S.M.P.E. Meet

An interesting list of papers were presented at the 56th Semi-Annual Technical Conference of the Society of Motion Picture Engineers, held in New York October 16-18. Following is the partial list:

"Practical Utilization of Monopack Film," by Charles G. Clarke, A.S.C., Twentieth Century-Fox Film Corp., Beverly Hills, Calif.

"The Application of the Polarograph to the Analysis of Photographic Fixing Baths," by Vaughn C. Shaner and Mary R. Sparks, Eastman Kodak Co., Hollywood, Calif.

"Color Densitometry and Its Application to Modern Multilayer Color Films," by Monroe H. Sweet, Ansco, Binghamton, N. Y.

"Two New Eastman Fine-Grain Sound Recording Films," by R. M. Corbin and N. L. Simons, Eastman Kodak Co., Hollywood, and D. E. Hyndman, Eastman Kodak Co., New York.

"Comparison of Variable-Area Sound Recording Films," by Dorothy O'Dea, Radio Corporation of America, Hollywood, Calif.

"A Push-Pull FM Circuit and Its Application to Vibratory Systems," by Alexis Badmaieff, Radio Corporation of America, Hollywood, Calif.

"FM Calibrator for Dick Recording Heads," by H. E. Roys, Radio Corporation of America, Indianapolis, Ind.

"Wave Propagation and Outdoor Field Tests," by F. L. Nopper and R. C. Moody, Electrical Research Products Division of Western Electric Co., Hollywood, Calif.

"Organization of Committees on Engineering of the SMPE," by D. E. Hyndman, Engineering Vice-President, Society of Motion Picture Engineers, New York.

"Projection Television," by Dr. D. W. Epstein, RCA Laboratories, Princeton, N. J., and Dr. I. G. Maloff, Radio Corporation of America, Camden, N. J.

"Application of Sound Recording Techniques to Airplane Vibration Analysis," by J. C. Davidson and J. G. Frayne, Electrical Research Products Division of Western Electric Co., Hollywood, Calif.

"Airplane Vibration Recorder," by G. R. Crane and J. C. Davidson, Electrical Research Products Division of Western Electric Co., Hollywood, Calif.

"Airplane Vibration Reproducer," by G. R. Crane, Electrical Research Products Division of Western Electric Co., Hollywood, Calif.

"The Future of the 16mm. Industry," by J. A. Maurer, J. A. Maurer, Inc., New York.

"An Automatic Mercury Control Circuit," by Hanovia Chemical and Manufacturing Co., Newark, N. J.

"Methods for Measurement of Brightness of Carbon Arcs," by M. P. Jones, R. J. Zavesky, and W. W. Lozier, National Carbon Co., Fostoria, Ohio.

"Study of Radiant Energy at Motion Picture Film Aperture," by R. J. Zavesky, M. R. Null, and W. W. Lozier, National Carbon Co., Fostoria, Ohio.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933,

Of The American Cinematographer, published monthly at Los Angeles, California, for October 1st, 1944.

State of California } ss.
County of Los Angeles }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Hal Hall, who, having been duly sworn according to law, deposes and says that he is the Editor of the AMERICAN CINEMATOGRAPHER and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are: Publisher, A.S.C. Agency, Inc., 1782 No. Orange Drive, Hollywood 28, Calif.; Editor, Hal Hall, 1782 No. Orange Drive, Hollywood 28, Calif.; Managing Editor, Hal Hall, 1782 No. Orange Drive, Hollywood 28, Calif.; Business Manager, Marguerite Duerr, 1782 No. Orange Drive, Hollywood 28, Calif.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediateiy thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) A.S.C. Agency, Inc., 1782 No. Orange Drive, Hollywood 28, Calif., a non-profit corporation wholly owned by the American Society of Cinematographers, Inc., 1782 N. Orange Dr., Hollywood 28, Calif. Officers of the American Society of Cinematographers, Inc., are: President, Leonard Smith, 1782 N. Orange Dr., Hollywood 28, Calif.; First Vice-President, Joseph Walker, 1782 N. Orange Dr., Hollywood 28, Calif.; Second Vice-President, Leon Shamroy, 1782 N. Orange Dr., Hollywood 28, Calif., Third Vice-President, Charles T. Clarke, 1782 N. Orange Dr., Hollywood 28, Calif.; Secretary, Byron Haskin, 1782 N. Orange Dr., Hollywood 28, Calif., Execuitve Vice-President, Treasurer and Business Manager, Fred W. Jackman, 1782 N. Orange Dr., Hollywood 28, Calif.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve month preceding the date shown above is........ (This information is required from daily publications only.)

(Signed) HAL HALL, Editor.

Sworn to and subscribed before me this 30th day of September, 1944.

(Seal) G. HAGAN, N. P.

Notary Public in and for the County of Los Angeles, State of California.
(My commission expires July 31, 1945.)

Who Can Judge?

(Continued from Page 374)

Personality will unfold and come to the surface in the pictures of the photo-enthusiast, and that is why so many kinds of pictures pass in review; good ones that can be bad ones and bad ones that can be good ones.

Criticism, good or bad, especially bad, has never killed a really good picture; the one that tells something.

The more an individual tries to impress somebody with his own expertness of opinion the more damaging his criticism can be to the sensitiveness of the one whose picture is criticised. But the criticism of the honest individual is worth analyzing whenever it is offered, for such criticism comes from the soul. It is not the kind of criticism that hurts, because it is constructive.

A very wise bard once wrote: "There is nothing good or bad, but thinking makes it so."

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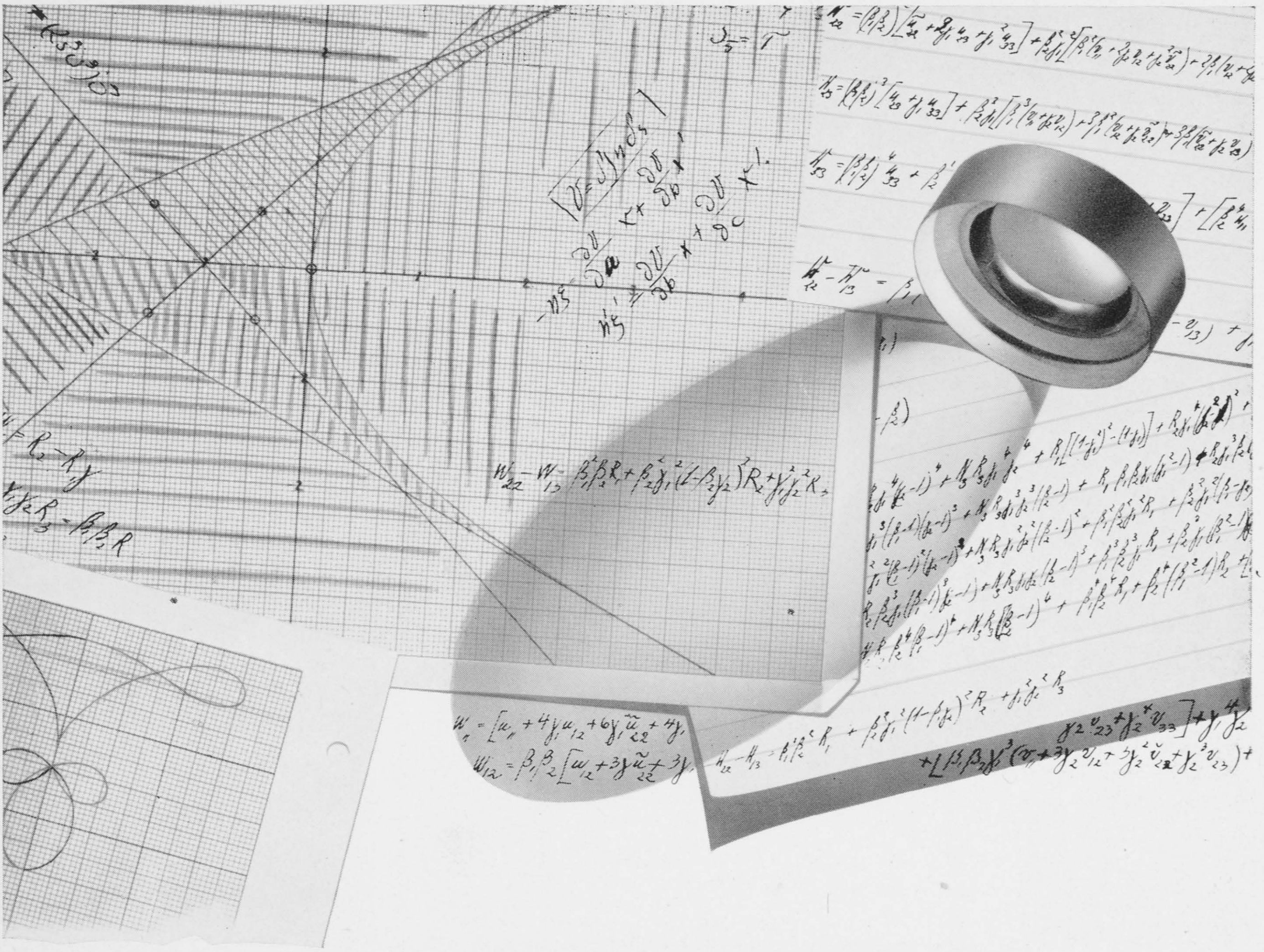

Mathematical problems

day after day, for as long as 3 years

Kodak

precision begins on paper—
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of calculations to design one Kodak lens

LIKE the musician who "hears" a tune when he sees a sheet of music—Kodak scientists "visualize" a camera lens in terms of numbers and symbols . . .

Computing the curvatures of a Kodak lens involves a long series of problems in "Optics." As an example of the mathematical labor necessary, it took 3 years of figuring—exact, in results, to a fraction of a "light wave"—to compute a recent Kodak Ektar f/1.5 lens.

As you know, "paper work" doesn't actually build anything. To theory must be added materials—and to materials, manufacturing and testing methods.

At Kodak, all these are distinctive. Everything which goes into a fine camera lens is designed and made. That includes not only entire optical assemblies . . . but, for many lens elements, the optical glass itself.

In 1941, Kodak scientists developed a method of making glass without sand . . . as revolutionary as learning to make steel without iron. This new rare-element glass has a much higher refractive index without marked increase in dispersion.

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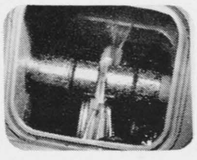
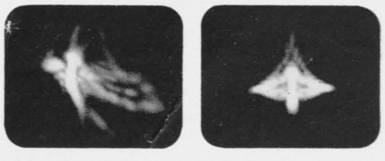


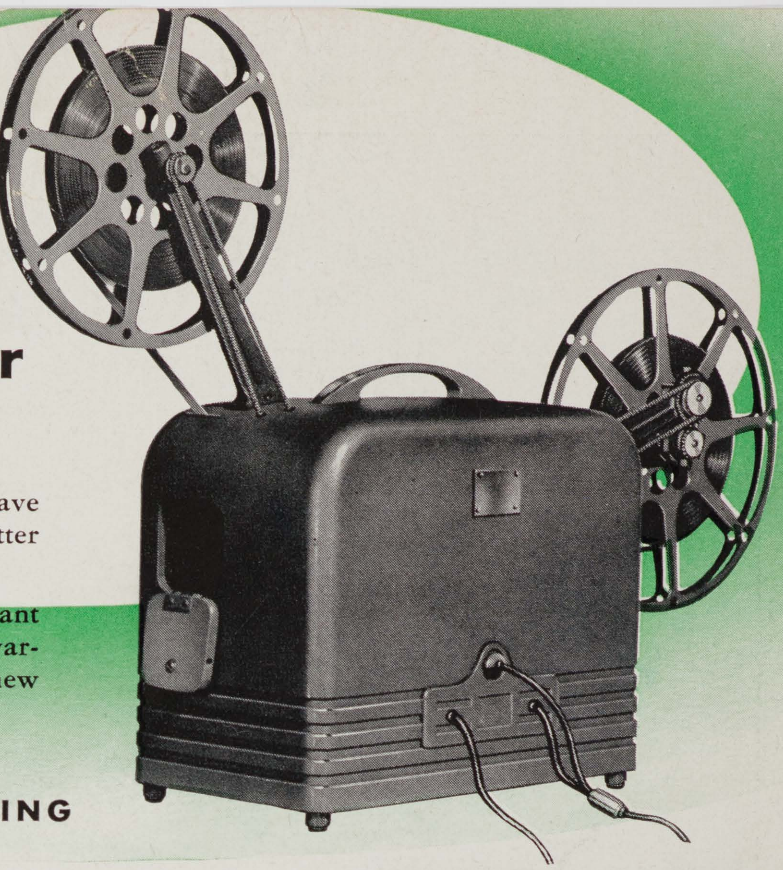
Kodak's lens centering machine, grinding the elements of a lens to the same exact dimensions around the common optical axis. Semi-automatic, this machine eliminates the human errors.



STARS BAD AND GOOD—At left a "bad" star, at right a "good" star, as seen in the lens bench microscope. In a lens which passes muster, the star must be symmetrical as to shape and color, and not exceed a maximum size. These star images were photographed at 11° off axis.

Serving human progress through photography

B&H Filmosounds



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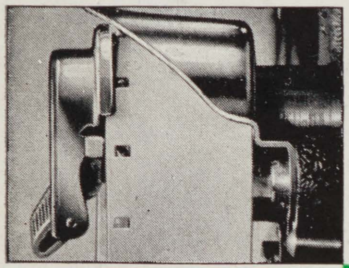

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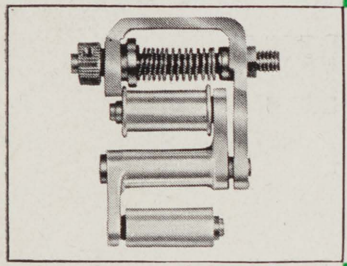

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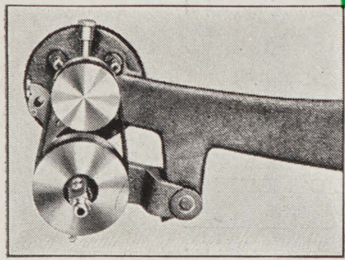

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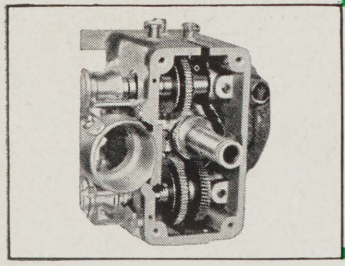

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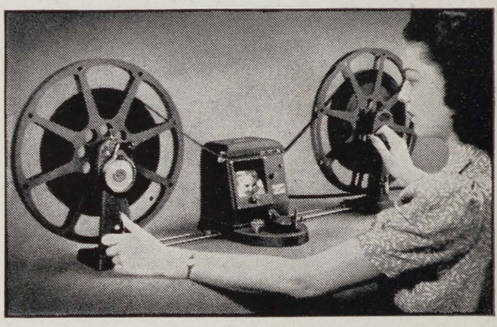

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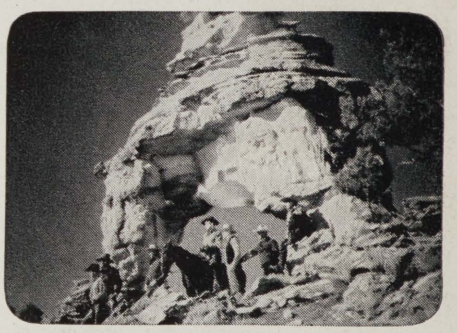

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